VOL. LXXII. JANUARY, 1916. No. 3

AMERICAN JOURNAL OF INSANITY

A SURVEY OF DEFECTIVE DELINQUENTS UNDER THE CARE OF THE MASSACHUSETTS STATE BOARD OF INSANITY.*†

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For many years the relation between mental disease, especially mental defect, and crime has been recognized, and attempts to make use of our knowledge of this relation have been many, but for the most part unsuccessful. In Massachusetts Dr. Walter E. Fernald has long urged action in this matter, and for a concise statement of the problem we can do no better than to quote him:

> To a trained observer the class of boys and girls in truant schools and in industrial and reform schools includes a rather large proportion of defectives where the intellectual defect is relatively slight and is overshadowed by the moral deficiency. The history of a case of this sort during infancy and early childhood, from a medical and psychological standpoint, is that of an abnormal child. While they generally present definite physical evidences of degeneracy, they are physically superior to the ordinary imbecile. Their school work is not equal to that of normal boys of the same age, but they are often abnormally bright in certain directions. They may be idle, thievish, cruel to animals or smaller children, wantonly and senselessly destructive and lawless generally. They are often precocious sexually and after puberty almost always show marked sexual delinquency or perversion. They are often wonderfully shrewd and crafty in carrying out their plans for mischief. They instinctively seek low company and quickly learn everything that is bad. They have little or no fear of possible consequences in the way of punishment. They acquire a certain spurious

* Being State Board of Insanity Contribution No. 44 (1915.10). The previous State Board of Insanity Contribution (1915.9) was by A. Warren Stearns, entitled "Note on Recent Extension of Out-Patient Work in Massachusetts Hospitals for the Insane," published in the Boston Medical and Surgical Journal, Vol. CLXXII, No. 15, pp. 553-555 (April 15, 1915).

† Read at the seventy-first annual meeting of the American Medico-Psychological Association, Old Point Comfort, Va., May 11-14, 1915.

keenness and brightness and possess a fund of general information which is very deceiving on first acquaintance. They are apt to be accomplished liars. The great army of police court chronic criminals, vagrants and low prostitutes is largely recruited from this class of "moral imbeciles." These children are not simply bad and incorrigible, but they are irresponsible by reason of the underlying mental defect. The mental defect and the moral lack are alike the visible effects of incurable affection of the cerebral cortex. No method of training or discipline can fit them to become safe or desirable members of society. They cannot be "placed out" without great moral risk to innocent people. These cases should be recognized at an early age, before they have acquired facility in actual crime, and permanently taken out of the community to be trained to habits of industry and as far as possible contribute to their own support under direction and supervision. They are not influenced by the simple system of rewards and deprivations which easily serves to control the conduct of the feeble-minded. They do not class well with the rather simple types of ordinary imbecility. When the actual number of this dangerously potential class of moral imbeciles is fully realized, they will be given lifelong care and supervision in special institutions combining the educational and developmental methods of a school for the feeble-minded and the industry and security of a modern penal institution. Such provision would only be a rational extension of the principle of the indeterminate sentence, and, if safeguarded by careful and repeated expert examination and observation, could do no injustice and would greatly diminish crime in the immediate future.

Also:

The patients described vary greatly in intelligence and in the amount of definite knowledge which they have acquired, but they greatly resemble each other in their childish tastes, excessive vanity, unreliability, aggressive boastful egotism, selfishness, moral insensibility, fondness for malicious mischief and trouble-making, indolence, willingness to run great risks for the sake of some small gain, untruthfulness, lack of shame and remorse, lack of sympathy, etc.

The cases described fairly represent the criminal imbecile type. I have no doubt as to the actual imbecility and the resulting moral irresponsibility of every one of these cases. As a group, the female cases especially well illustrate the so-called "high-grade imbecile." In fact, the physical and psychical stigmata exhibited by this group of imbeciles, selected because of their criminal tendencies and acts, are merely the usual signs and symptoms found in the ordinary case of imbecility, modified only in *degree* and not in *kind*.

This class of borderline cases with criminal tendencies now constitutes a troublesome and puzzling factor in our institutions for the feeble-minded. They are often malicious, deceitful, and inciters of mischief and insubordination. They have a wonderful power of suggestion over their simple-minded fellow-patients. They are generally committed to the institution against the wishes of their parents. The efforts of their friends to obtain

their release are constant and perplexing. If a case of this description is taken before the Supreme Court on a writ of habeas corpus, it is more than likely that the patient will be released. Indeed, it is not difficult to find reputable medical men who would testify that the case "is by no means a fool," and that he ought not to be deprived of his liberty. It is evident that clinical types and shadings of mental deficiency have become familiar to the alienist which have not yet been so definitely formulated and classified as to be readily recognized by the profession generally. It is equally true that the legal definitions and precedents pertaining to ordinary cases of imbecility are inadequate when applied to these high-grade imbeciles. We have, therefore, to face the anomalous fact that it is easy to have a class of patients committed to our institutions who are promptly discharged by the higher courts because these lesser types of deficiency have neither been adequately formulated medically nor recognized legally.[3]

More recently the term "defective delinquent" has been applied to this group, and we find in 1911, in the report of the commission to investigate the question of the increase of criminals, mental defectives, epileptics and degenerates, under the heading "Defective Delinquents," the following:

There is urgent need of special legal recognition of the class of defective delinquents, and of suitable provision for their proper commitment and permanent detention. The law should recognize that such a class exists by making a distinctive legal definition. There should be a definite form of procedure for the commitment of the defective delinquent similar to that used for the commitment of the insane. This procedure should be equally applicable to cases in the courts or in the community, to youthful and adult criminal defectives, and to cases which develop in the institutions for the feeble-minded.

They should be committed to permanent care and custody, under special institutional conditions combining the educational and developmental methods of a school for the feeble-minded with the industry and security of a modern penal institution. Under proper conditions, perhaps in a farm colony, the directed labor of these persons would materially reduce the cost of their support. Their immoral and criminal depredations would be prevented, the cost of repeated arrests, trials and commitments would be avoided, and they would not be able to bring helpless children into the world. Provision should be made for the safeguarding of the rights of the individual by periodical expert examination and observation, and by the possibility of ultimate release under parole.

This latter report was instrumental in the passage of a law in 1911 designed to provide for the care of this class. (Law appended.) This law has not been utilized, unfortunately, and still awaits the measures necessary to put it in action.

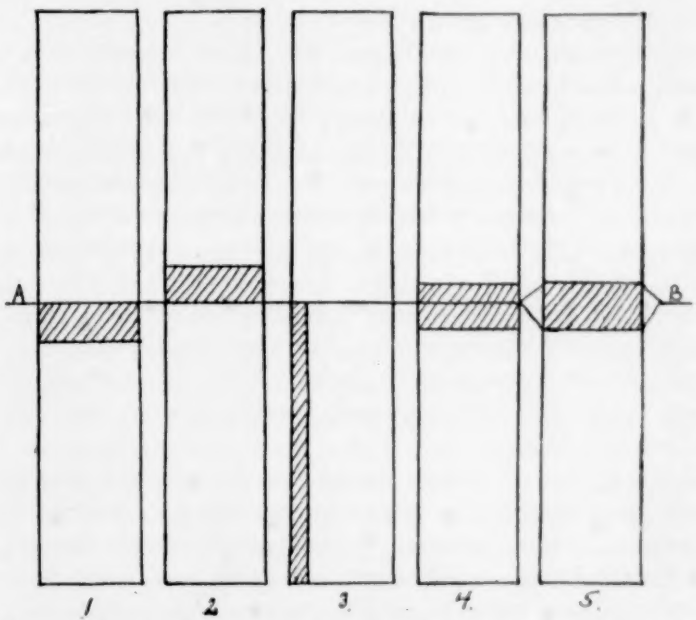
Public sentiment has been aroused, however, and the frequent attempts to get such patients into the schools for the feeble-minded and hospitals for the insane, and the many complaints from superintendents when they were by chance admitted, led the Massachusetts Board of Insanity to make a survey of all such patients in the hospitals under their control, to see, first, how many such patients were under their control, and, secondly, to see what measures could be undertaken to assist in the solution of this problem.

The term was found to be in quite general use, though rarely as an official diagnosis. "Moral imbecile," "psychopathic inferiority," "constitutional inferiority," as well as "imbecile" and "feeble-minded," were used. The following table shows the number of feeble-minded without a definite psychosis in the hospitals for the insane, and also those of this number who come within the defective delinquent group.

	Feeble-minded			Defective Delinquents			
Hospital	M.	F.	T.	M.	F.	T.	Remarks
Worcester	16	20	36	..	4	4	
Taunton	33	16	49	..	8	8	
Northampton	53	35	88	3	5	8	
Danvers	26	25	51	1	5	6	
Westborough	18	24	42	2	6	8	
Boston	22	16	38	..	..	..	
Grafton	5	10	15	..	6	6	
Medfield	18	19	37	..	8	8	
Gardner Colony	27	24	51	1	8	9	
Tewksbury Infirmary	16	40	56	..	6	6	
Bridgewater	50	..	50	13	..	13	Males only
Monson	..	..	..	..	..	..	Epileptics only
Foxborough	3	4	7	2	4	6	
	287	233	520	22	60	82	Totals in hospitals for insane.
Mass. School for the Feeble-minded ..				10	19	29	Entire population feeble-minded.
Wrentham State School				20	27	47	
Grand Totals				52	106	158	

Some difficulty was experienced in deciding, in any given case, whether to apply the term "defective delinquent," though the group itself stands out quite clearly. The following chart illustrates the different ways in which the term is used, taking the intellectual level alone as a standard.

Fig. 1 represents the most common conception. *A—B* represents the dividing line between an intelligence which is called nor-



CHARTS SHOWING POSITION OF DEFECTIVE DELINQUENTS IN INTELLECTUAL SCALE. *A—B* DIVIDES NORMAL AND FEEBLE-MINDED. SHADED PORTIONS REPRESENT DIFFERENT CONCEPTS OF THE DEFECTIVE DELINQUENT.

mal and one called feeble-minded. The shaded portion represents a small group of morons who have emotional and volitional instability and criminal tendencies.

Next in frequency is the concept represented by Fig. 2. *A—B* has the same significance as in Fig. 1. Then the shaded portion represents a group just above the feeble-minded grade, but akin to them, and showing marked criminal traits. This corresponds with the definition given by Dr. Guy G. Fernald: "To explicitly

define the class we may regard as within the group of defective delinquents one whose mentality is so imperfectly developed that he is unable to support himself honestly, and whose acts repeatedly conflict with established social and legal requirements. Above the maximum limit of this group are those who are mentally competent for self-support and below its minimum limit are morons, imbeciles of institution grade and idiots. In other words, the defective delinquent is one who is smart enough to get into trouble but is not smart enough to keep out of it."[8]

Fig. 3 represents a less frequent use. Here it is applied to any grade of feeble-minded patient who shows criminal tendencies.

As has been said before, though the group itself seems fairly clear-cut, it is often quite difficult to decide in a given case; and the writer feels that, regardless of theoretical considerations, usage will include a group overlapping the lower end of normal and the upper end of the feeble-minded, but having a characteristic anti-social attitude (Fig. 4). Here the old division of the feeble-minded into restless and stupid types applies, for some are anti-social because of restless activity, others because of indifferent following of what appears to be the easy way. Some consider the group to be suspended midway between normal and feeble-minded, as in Fig. 5.

A few figures will perhaps describe the group to best advantage. Since, generally speaking, being a moron has been a criterion upon which to base the diagnosis, practically all fall within this group. Of the 158 defective delinquents, 106 were females and 52 were males. This difference is probably explained by the large number of males in prisons. Of the 22 male defective delinquents in the hospitals, 13 are in the Hospital for the Criminal Insane at Bridgewater, so that as far as hospitals for the insane are concerned, females are the chief problem, there being 60 of these.

The typical life history of these individuals is one succession of contact with penal and social agencies. Of the 158 cases, 43 or 27.2 per cent. have previously been in some penal institution; 79 or 50 per cent. have been in some hospital for the insane or feeble-minded (insane, 57; feeble-minded, 22); 23 or 14.5 per cent. have been in charge of some private charitable organization; and 12 or 7.6 per cent. have been wards of the State Board of Charity.

As for their delinquencies, it is of course impossible to record every anti-social act, yet the following are given as most prominent in the records, in order of frequency:

Sex offenders	84
Uncontrollable temper	57
Stealing	53
Illegitimate child	29
Runaway	15
Venereal disease	13
Alcoholic	6
Murder	6
Setting fire	4
Assault and battery	3
Morphine	1
Miscellaneous, such as unruly, dishonest, truancy, stubborn, profane, noisy, troublesome, quarrelsome, rebellious, tramp, violent, breaking windows, etc.	25

It will be seen that a good many of these descriptive terms apply to reaction to hospital environment, and that many are "criminals who have committed no crime."[2]

Obviously these individuals are a menace to the community and require more or less permanent institutional care. They do not get along well in the prisons or in the schools for the feeble-minded, and at present are more comfortable in the hospitals for the insane. This is probably due to the fact that they can be widely separated, also that they feel their superiority there, make friends with nurses, have little compulsory work and no discipline. It seems that the farther they get from prison methods and discipline, the more comfortable is their condition. This has made the ordinary prison care notably unsuccessful with this class of cases.

On the other hand, they easily escape from insane hospitals, they do not learn a trade or other work which makes them useful, and they are out of place with psychotic patients. In the schools for the feeble-minded they are a disturbing factor. They cannot be held without escape, they are too old for educative school measures, and are a source of physical and moral danger to ordinary feeble-minded patients.

All of these facts speak for a segregation of this type, and the question arises as to who should take up the burden, at present inadequately cared for by prisons, schools for the feeble-minded and

insane hospitals. There is no doubt that the prisons should provide for such cases, and the appended law seems adequate, could it but be put in operation. The abundant reasons for the passage of this law justify active steps on the part of prisons to care for those cases whose criminal life overshadows their mental defect.

Next, though they are undoubtedly out of place in the ordinary school for feeble-minded, a large number come legitimately within the duties of those caring for the feeble-minded. Many, especially females, are never arrested, their defect is recognized and their troublesome behavior is merely a manifestation of such defect. They differ from the children in the feeble-minded schools only in age. Indeed, many are considered proper subjects of such schools until adult life, with its resulting sexual activity, is reached. For this reason more provision should be made for the adult feeble-minded of both sexes, and especially for females of the child-bearing age.

The hospitals for the insane will always have many feeble-minded complicated by a superimposed psychosis. There are many feeble-minded, however, who have slight episodes, or outbreaks transitory in character, which result in their commitment to hospitals for the insane. These, if there were more provision for adult feeble-minded, would better be classed as feeble-minded and kept in institutions for such, and no uncomplicated feeble-minded should be in hospitals for the insane, whether delinquent and troublesome, or not.

REFERENCES.

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2. Fernald, Walter E., M. D., "The Imbecile with Criminal Instincts," American Journal of Insanity, Vol. LXV, No. 4, April, 1909.
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APPENDIX.

Acts of 1911, Chap. 595.

An Act to provide for the maintenance, at the Reformatory for Women, the Massachusetts Reformatory and the State Farm, of departments for defective delinquents.

Be it enacted, etc., as follows:

Section 1. If in any case where a court might by way of final disposition commit an offender to the state prison, the reformatory for women, or any jail or house of correction, or to the Massachusetts reformatory,

the state farm, or to the industrial school for boys, the industrial school for girls, the Lyman school, any truant school, or the custody of the state board of charity, for an offence not punishable by death or imprisonment for life, it shall appear that the offender has committed the offence with which he is charged, is mentally defective, and is not a proper subject for the schools for the feeble-minded, or for commitment as an insane person, the court may commit such offender to a department for defective delinquents, hereinafter established, according to the age and sex of the defendant as hereinafter provided.

SEC. 2. If an offender while under commitment to any of the institutions or to the board named in section one of this act persistently violates the regulations of the institution or board in whose custody the offender is, or conducts himself or herself so indecently or immorally, or otherwise so grossly misbehaves as to render himself or herself an unfit subject for retention in said institution or by said board, and it appears that such offender is mentally defective and is not a proper subject for the schools for the feeble-minded, the physician in attendance at such institution or a physician employed by said board shall make a report thereof to the officer in charge of said institution or to the superintendent of minor wards of said board, who shall transmit the same to one of the judges mentioned in section twenty-nine of chapter five hundred and four of the acts of the year nineteen hundred and nine. The judge shall make inquiry into the facts and, if satisfied that the offender is mentally defective and is not a proper subject for the schools for the feeble-minded, shall order the removal of the offender to a department for defective delinquents, hereinafter established, according to the age and sex of the defendant as hereinafter provided.

SEC. 3. No person shall be committed to a department for defective delinquents under the two preceding sections unless there has been filed with the judge a certificate of the mental defectiveness of such person by two physicians qualified as provided in section thirty-two of chapter five hundred and four of the acts of the year nineteen hundred and nine and acts in amendment thereof or in addition thereto. The fees of the certifying physicians shall be of the amount and paid in the manner provided for like service in said chapter five hundred and four, and acts in amendment thereof and in addition thereto.

SEC. 4. If an inmate of a school for the feeble-minded persistently violates the regulations of the school, or conducts himself or herself so indecently or immorally, or so grossly misbehaves as to render himself or herself an unfit subject for retention therein, the officer in charge of the school shall make a report thereof to one of the judges mentioned in section twenty-nine of said chapter five hundred and four. The judge shall make inquiry into the facts and, if satisfied that such inmate is not a fit subject for retention in the said school, shall order the removal of the inmate to a department for defective delinquents, hereinafter established, according to the age and sex of the inmate as hereinafter provided.

SEC. 5. At the reformatory for women, the Massachusetts reformatory, and the state farm there shall be maintained departments to be termed departments for defective delinquents, for the custody of persons committed thereto under this act. All male persons under twenty-one years of age committed under the provisions of this act shall be committed to the department at the Massachusetts reformatory. Men twenty-one years of age, or over, committed under this act shall be committed to the department at the state farm. All women and girls committed under this act shall be committed to the department at the reformatory for women. All persons committed to the departments for defective delinquents hereby established at the reformatory for women and the Massachusetts reformatory shall be and remain in the custody of the board of prison commissioners until discharged as hereinafter provided, and all persons committed to the department for defective delinquents hereby established at the state farm shall be and remain in the custody of the trustees of the state farm until discharged as hereinafter provided.

SEC. 6. The prison commissioners and the trustees of the state farm may, respectively, parole inmates of the departments for defective delinquents, herein provided for, at their respective institutions, on such conditions as they deem best, and they may at any time recall to the institution any inmate paroled.

SEC. 7. Any person may apply at any time to the justice of the district, police or municipal court in whose jurisdiction a department for defective delinquents is located for the discharge of any inmate of said department. A hearing shall thereupon be held by said justice, of which notice shall be given to the applicant and to the person in charge of the institution where the inmate is confined. If after the hearing the justice shall find that it is probable that the inmate can be suffered at large without serious injury to himself or herself, or damage or injury or annoyance to others, the authorities having custody of said inmate shall parole the inmate. Further action on the application for the inmate's discharge shall be suspended for one year from the date of his or her parole. If at the end of said year the justice of the court where the application was filed shall find that said inmate can be suffered to be permanently at large without serious injury to himself or herself, or damage or injury or annoyance to others, the authorities having custody of said inmate shall discharge the inmate. If, at any time prior to the expiration of said year of parole, the justice of the court where the application was filed shall be satisfied that the best interest of said inmate, or of the public, require the recall of the inmate from parole, he may authorize the authorities having custody of the inmate to recall the inmate from parole. If an application is denied, a new application shall not be made within one year after the date of the order denying the previous application. If a person discharged under the provisions of this section is found by any court to have committed, after his discharge, any offence against the laws of the commonwealth, said court may commit such person to a department for defective delinquents without the certificate of any physician.

SEC. 8. Any special justice, when holding court at the request of the justice, shall have the powers and perform the duties of the justice under this act. In case of a vacancy in the office of justice and in the case of the illness, absence or other disability of the justice, the special justice who holds the senior commission shall, if no request has been made as aforesaid, have the powers and perform the duties of the justice under this act.

SEC. 9. The record of all proceedings under this act, and all papers in connection therewith, shall be kept as provided in section forty-one of chapter five hundred and four of the acts of the year nineteen hundred and nine, and the same docket shall be used for the proceedings under this act which is used under said section forty-one.

SEC. 10. All commitments under this act shall be made under an order signed by the judge making the order. Orders for commitment may be served by any person qualified to serve any processes issued from the court in which the justice making the commitment sits or, in case of transfers, by any officer or attendant of the institution from which the transfer is being made. The officer or other person serving such order shall make return of service on an attested copy of the order.

SEC. 11. All the expenses attending all proceedings under this act shall be allowed, certified, and paid in the manner provided in section forty-nine of chapter five hundred and four of the acts of the year nineteen hundred and nine and acts in amendment thereof and in addition thereof.

SEC. 12. This act shall take effect when the departments named in section five are ready for occupancy. The prison commissioners and the trustees of the state farm shall notify the governor when said departments are in a suitable condition to receive inmates; and the governor may then issue his proclamation establishing such departments as places for the custody of defective delinquents. *Approved June 27, 1911.*

SENSORY PHENOMENA IN EPILEPSY.

By E. MURRAY AUER, M. D.

(From the New Jersey State Village for Epileptics, Skillman, N. J.)

Recent investigations have gone far to confirm the important role played by heredity and have repeatedly shown that infants born of parents affected with the different neuroses because of an excessively susceptible nervous system may display convulsions. This predisposition of the subjects with neuropathic taint has been termed by Joffroy "Aptitude Convulsive" and by Féré "Spasmophilia."

The exciting causes of convulsions are legion: cerebral congestion, cerebral trauma, encephalitis, cerebral sclerosis, neoplasm, meningitis, cerebral hemorrhage and hydrocephalus; by reflex action through gastro-intestinal disturbances, diseases of the viscera, body membrane, genitalia, teeth and organs of sense; after acute infection, *i. e.*, scarlet fever, typhoid, pneumonia, diphtheria, cholera; after intoxication, endogenous or exogenous, *i. e.*, autotoxins, uremia, eclampsia, alcohol, absinthe, lead, strychnine, opium, cocaine, caffine, ergot, arsenic, carbon-monoxide; the neuroses and following fright.

Epilepsy, the most common cause of convulsion, takes its place etiologically in a group between the organic lesions and the neuroses, assuming that for the latter we have no organic basis. Epileptic phenomena are manifestations of either a hyper or hypo cerebral activity occasioned by an irritation of a transitory nature producing a disturbance of the inhibition of either a normal or a pathological central nervous system, dependent upon the portion of the brain affected. Epileptic manifestations may occur at any time, are not under the control of the patient, and may or may not be accompanied by unconsciousness. Epilepsy usually has its onset in infancy or adolescence and after infancy its occurrence in the feminine sex predominates due to the onset of puberty, gestation and child birth. The influence of the menses is extremely variable inasmuch as both the onset and cessation of convulsions

have been observed at the establishment of menstruation and at the menopause. In a large majority of women afflicted, epileptic phenomena are aggravated at the time of the menses, but in others there is no appreciable change. Epilepsy occurring after 35 years of age was considered by Fournier to be invariably of specific origin; however, late epilepsy may also occur in alcoholism and arteriosclerosis, in which former condition Claude (Progrès Médical, P. 497, Oct., 1912) maintained that the absorption of the alcohol does not suffice to occasion the disease but that it is necessary that the individual present an "aptitude convulsive." Investigation of the history of many epileptics with phenomena of comparatively late onset following some exciting cause, reveals the fact that they have suffered from convulsions during infancy, as notably shown in the following case:

M. E. The patient had convulsions in infancy, during dentition. She passed a normal childhood and adolescence. She married and had four children. The third child in line of birth at the age of two and a half years fell down a flight of stairs and was instantly killed before the eyes of its mother. After this shock the mother had a severe convulsion and since that time has been subject to grand mal seizures. Shock in this case was unquestionably the exciting cause but one cannot deny a susceptible nervous system as shown by the occurrence of convulsions in infancy. Tekhomiroff (Review [russe] de Psychiatrie, de Neurologie Experimentale, Mars, 1913) reported the case of a soldier of 22 years of age who after a moral shock developed a "status epilepticus" in which he died. Oppenheim stated, "I have seen no small number of cases in which the individual, who until this time had shown only symptoms of neurasthenia, hysteria or psychesthenia, under the influence of a heavy psychic shock seized with epileptic convulsions." Since the onset of the present war, Oppenheim (Berlin. klin Wochenschr., 1914, N. 48) has observed an exacerbation of epileptic phenomena in personally observed cases, and concluded that it seemed possible that severe neuroses and organic changes of the nervous system may develop through the mechanical impulse occasioned by a passing shell or through its explosion without its coming in direct contact with the individual, just as has been observed as occurring after lightning stroke.

The occurrence of epileptic phenomena in syndromes, unquestionably the result of the disease of the glands of internal secretion, need not necessarily be considered as a direct result of this glandular disturbance, but rather, the result of the auto-toxin arising from this disturbed glandular function acting on a nervous system of lessened resistance or lowered inhibition. Bolten (Deutsche Zeitschrift für Nervenheilkunde, 1914) stated, "Genuine epilepsy is a chronic auto-intoxication arising through metabolic processes in which, as a result of hypofunction of the thyroid and parathyroid

glands, the poisons are not thoroughly neutralized or removed." That there surely is some other factor than the hypofunctioning of the thyroid or parathyroid glands is shown by the fact that a great majority of cases of hypothyroidism exhibit no epileptic phenomena and that many cases of hyperthyroidism do exhibit such tendencies. Despite the fact that various toxines have a predilection for different portions of the nervous system one cannot exclude the possibility of a variable resistance of the different portions of the central nervous system, inasmuch as the number of epileptics constitutes but a small percentage of the cases of intoxication or auto-intoxication, and because of the occurrence of epileptic phenomena of a physical motor and sensory nature.

Sensory manifestations may occur either as pre-paroxysmal, paroxysmal, or post-paroxysmal phenomena, in the former condition constituting the well-known "Aura." As aura may be cited the following sensory phenomena, gathered from examination of the patients in this institution and herewith submitted.

Visual.—"Flashes of light," "dark, fleeting spots," "red and green colors," "balls of fire," "lines moving up and down." In the cases showing this, inquiry has resulted in the statement that the manifestations are in the perpendicular and seen with the eyes opened and closed. "Objects decreasing in size," "shadows of things jumping up and down," "blurring of vision," "dark cloud descending," and "things like diamonds."

F. B., aged 13, case of Dr. William G. Spiller, University Hospital Dispensary Service.

Patient's previous and family history negative.

On December 13, 1913, the patient was struck on the head by an automobile. He was unconscious for six days after the accident, during which time he had twitching of the face, arms and legs, more on the right than on the left side.

August 13, 1914, he began to have convulsions; his first convulsion was preceded by vertigo in which his head seemed to whirl from right to left; the outside world seemed whirling in the same direction; the convulsive seizures seemed limited to his face and equally so on each side. He was stiff all over his body but clonic only in his face. From October 1, 1914, to January 13, 1915, he had five attacks. He has aura of bands of light, vertical in arrangement, first red, then green, and then purple. These colors are in the axis of central vision; at times he has had the aura without the convulsion.

Examination of the eye grounds was negative. Nothing of importance in the physical or neurological examination.

Auditory Aura.—"Humming," "buzzing," "hissing," "roaring," "unusual quietness," and as in Gowers' cases "a crash (compared to an explosion) in his head or a clang as though a piece of metal was struck within his head," "voices repeating in her head."

Olfactory.—"A disagreeable acid odor which gradually becomes more offensive until he loses consciousness."

Gustatory.—"A salty, bitter taste," "a tasting of sour on his tongue and lips."

Visceral.—Epigastric pain is the most common aura and may be sharp shooting, or a dull heavy pain. There may be "gnawing," "burning," "an indescribable feeling," "as though something heavy had crawled over the stomach," "something moving in the stomach." One also notes "pain in the chest," "palpitation of the heart," "pressure or pain over the heart," or "turning about of the heart." "Choking and tickling sensations of the throat," "suffocation," "strangling," "desire to urinate and stool."

Aura of the nature of a paresthesia may be unilateral or bilateral of any location and distribution, "a slow freezing sensation of cold, beginning in the soles of the feet and ascending to the head." There may be a true chill, with shivering and chattering of the teeth, "tickling over the entire body," "needle-like pains in the left fingers and arm," "numbness of the left arm," "stinging feelings in the fingers of the right hand."

Camp (Journal of Mental and Nervous Disease, February, 1910) reported a "feeling as though the left leg were going up in the air," although in reality it did not move. "Numbness of the tongue," "feeling of pins and needles, as though the arm or leg had been asleep," "cramping pain, beginning in both big toes, and occasionally in the fingers," all have been described.

H. B., born February 3, 1875, full term, normal birth.

Admitted, May 27, 1915.

Family History.—The patient is the third in line of seven conceptions of which there were three miscarriages. One brother died in convulsions at three months of age, another at two years of age, another brother is said to have had convulsions during a fever and now is considered to be defective. The patient's father was the seventh in line of birth of nine children and at the age of 71 he died in an asylum, having been insane only for the last three months of his life. The other children exhibited nothing of note except that one sister, Martha, was mentally deficient. The paternal grandfather was tubercular, otherwise negative. The mother is still living, and is a strong, healthy, ignorant woman, who is said to have had no convulsion during dentition and to have always been nervous and to have had nervous prostration at one time. She was an illegitimate child, and has four maternal half brothers, and one maternal half sister who is said to be hysterical. One brother is said to have been a heavy drinker and immoral, another who was a heavy drinker was said to have died of some venereal disease. A third brother, Robert, who was a hard drinker, very nervous and subject to severe headaches, married a woman who had headaches and whose father was an epileptic. They had five children, two of whom have shown epileptic manifestations. The maternal grandmother is still living. There is nothing of note in the history of the maternal grandparents.

The patient is said to have had her first convulsion at two years of age as a result of worms. When she was six years of age her father punished her and shoved her from him. She fell, striking her head on the corner

of a brick and was unconscious for several hours, after which she is said to have been paralyzed for nine months. The side of the paralysis is not given. She had her second convulsion after this paralysis and has had them since.

She is a small, well-nourished, sallow-complexioned woman of middle age, who walks with a limp, due to a shortening of the right leg, the result of an old fracture. She has an exopthalmos due to an uncorrected high degree of myopia. The heart is strikingly slightly enlarged, and there is a loud, harsh mitral systolic murmur heard at the apex and transmitted to the axilla and the back. The pulse is irregular in force and rhythm. The liver is slightly enlarged and painful on palpation. The neurological examination reveals nothing of note. Mentally the patient is defective, but there are no delusions or hallucinations.

Description of Attack.—A black round object appears about to fall from above and to the left upon her head; she can close her eyes and still see it. She will raise the left arm to protect herself and her eyes then begin to move to the right and upward. She is transitorily unconscious, after which she is unable to feel anything on the left side and that side feels cold to the touch. There is a loss of all form of sensation on the left side for a period of approximately six hours. She has other spells in which sensory symptoms precede a hard convulsion. Rainbow colors suddenly begin to dance up and down before her eyes. Green is the most prominent color and red the next, she sees these with her eyes open and closed, but more clearly in the latter condition. She sees these in the entire visual field and they appear to be more faint in the right eye. She has then a feeling of pin prick and a feeling as though the left side were asleep. Then the entire side is extremely cold, "as though she had ice instead of human flesh." The left side then becomes numb, and all sensation is lost. At times, she has a feeling of a transitory nature, as though some one was thumping her in the pit of the stomach. This precedes a severe grand mal attack of 10 or 15 minutes.

The first warning of convulsion is a dull frontal pain, more marked on the right side. Things before her then become all colors, "and the shadow of things about me will be dancing up and down." At the same time she is seized with a feeling of numbness in the left arm, side and leg, and will shriek, "I'm numb, I'm numb." The left side has a feeling of pin pricks "as if your foot has gone to sleep." Cries for some one to come and rub her side, and does not feel anything in this side until "they have rubbed the life back into it." In five to ten minutes she will fall to the floor, if up, unconscious, will roll about a few times and then convulse, frothing at the mouth, for five to eight minutes. Does not bite her tongue or soil her clothing. Is extremely weak after her seizure. Has petit mal attacks in which she has suddenly great difficulty in seeing, more marked in the right eye. She has a "thumping pain in the stomach and a feeling on the right arm as though she had bumped her funny bone." She has a sensation of being blind and cries, "I am dying, I am dying." She does not appear to lose consciousness and with these does not convulse. This is of about

10 minutes duration and after it the patient is weak for two or three hours. In her grand mal attacks she occasionally has most marked change of temper, and in contrast to her usual mild, docile nature, scolds, shouts and is exceedingly angry. The attacks occur usually before her menses. She is of an ashen color until she begins to convulse and then is almost purple. Patient was at Vineland previous to coming here.

A. B., aged 27. Private patient of Dr. William G. Spiller.

The patient's mother has headaches preceded by a sensation of something dropping before her eyes. Her headaches are relieved after vomiting. She is said to be a neurasthenic. His father is very excitable and neurotic. During childhood and adolescence, the patient had severe headaches on an average of once a week, until the age of 17 or 18. He is very high strung, married and has two children. He denies venereal disease and gives no history of tuberculosis. He drinks perhaps one glass of beer a month and an average of one cup of coffee daily.

Three years ago, at the age of 24, he was taken with an attack in which the right side suddenly became numb. He could not localize the onset of the numbness in any one part but states that wherever it began it spread over the entire right side in waves, *i. e.*, it disappeared from one part and returned to it shortly. Since then he has had six or seven attacks in a day and has gone as long as three months without having any. In some attacks he has had difficulty in speaking for a moment, at other times he had a twitching of the right orbicularis palpebrarum. At still other times, he has been unable to write correctly during these attacks, and on one or two occasions has had tinnitus aurium in the right ear. About one year ago, previous to an attack, he had a sensation of a veil drawn before his eyes, producing complete blindness. There is no weakness and no involvement of the left side.

Pupils are round, equal, react promptly to light, direct and consensual and in accommodation. Sense of touch and pain are normal, on both sides of the face, both hands and both legs. Stereognostic sense, sense of passive movement are normal in both hands. Grasp of each hand is powerful, no weakness anywhere. Right knee jerk entirely normal, left slightly diminished. He is not subject to pain or ataxia. The attacks have not been as numerous recently, but appear to be more severe of late. He has on an average of three or four daily, and is entirely free only for one day. Previous to some of his attacks he has tinnitus aurium of the right ear, like a blacksmith pounding an anvil, and he can almost believe he hears it. The attacks are strictly confined to the right side.

On February 27, 1913, he had a severe occipital headache which lasted two days and a similar headache in March, but this was accompanied by no visual phenomena. Occasionally, during his attacks, he is aphasic and unable to utter a word.

On October 1, 1913, the patient stated that at one time the numbness gradually spreading over the entire right side will be the noticeable feature of an attack. At another time, a painful sensation of burning or stinging or flashes of heat, and again of cold will be the most prominent. Speech is sometimes impossible for a few moments.

May 7, 1914. The patient was conscious of the onset of what seemed to be a more severe attack and his right arm began to flex strongly in spite of his effort to resist it. He then lost consciousness and was later told he was unconscious for 10 or 15 minutes durng which time he had a typical epileptic seizure, with little clonic spasm. He did not bite his tongue or soil his clothing. After the attack, he had severe pain in both shoulders, especially in the deltoids, and also about the temporal maxillary articulation. He had no desire to sleep.

May 14, 1914. Attacks have become more frequent of late, and in some he is unable to speak for one-half to one minute, has an excessive secretion of saliva and tears, and frequently a ptosis of the right eyelid, and some times both lids would close in spite of voluntary effort to keep them open. At times, he states he had an almost irresistible desire to flex the right arm and to rub the right cheek, but has prevented this by strong effort. Always with his attacks there is a peculiar numbness or tingling of the right lateral half of the body.

May 22, 1914. Patient describes a similar attack of numbness and tingling, during which his right arm was noticeably ataxic, but there was no loss of the stereognostic sense.

Post-paroxysmal phenomena are not as common, especially so of the special senses; amblyopia has been reported, as has also constriction of the visual field. Thompson and Oppenheim considered this latter occurring more especially in attacks of a psychical nature, but it is stated by Féré that it is also found as a result of attacks with a loss of consciousness.

Auditory disturbances are extremely rare, although deafness has been described. The loss of the senses of smell and taste have been described following serial seizures. Diminution or a loss of sensation has been noted after convulsions, lasting from a short time to a day, touch and pain being usually affected.

Straussler (Monatsschrift für Psychi. und Neurologie, Mai, 1908) cited the case of a man aged 22, with an endocardial lesion, who had convulsive attacks which began in the right arm and were followed by a right-sided hemiplegia. Sensations to touch, pain and temperature were diminished over the right side of the body. Lewandowsky (Deutsche Med. Wochenschrift, 1907) reported a case of Jacksonian epilepsy followed by hemiplegia in which there was a subjective sensation of coldness in the paralyzed side.

Perugia (Riforma Medica pp. 876-879, Apr. 9, 1913) reported the case of a young man aged 23, who, after a convulsion became deaf and mute, and was unable to speak, but he could express himself by writing. This mutism would last as long as five days. The

author excluded hysteria, and considered the motor aphasia and deafness as of toxic origin.

H. Bennett in this connection has stated that the sensory disturbances as post-paroxysmal phenomena stood in no direct relationship either to the intensity of the seizures or the degree of motor convulsions.

Without reviewing the extensive literature concerning the association of migraine to epilepsy, one must in considering the influence of heredity, the onset during early life, the periodicity of attacks, the occurrence of prodrones, the unilaterality, exhaustion, chilliness, and the occurrence of unilateral paresthesias and transitory aphasia, observed in both conditions, admit a justifiable ground for relationship.

C. W. (N. J. S. V.), aged 20. At the age of 11, early one morning while in bed, patient had a typical grand mal seizure, after which he slept for a long time, but upon waking had a severe headache and was nauseated. Two months after this attack he was struck in the left eye with a base ball, which resulted in the loss of vision of his left eye. He has on an average an attack once or twice a month. These are usually nocturnal. Previous to his attacks he has a very slight pain in both eyes, and things about him become rigid and statue-like. This lasts about five minutes, when at arms length a bright spot the size of a dollar appears, and he follows this always moving to the right and his head and eyes turn to the right. He has tried to look away from this but cannot. He does not see this with the left eye. After a severe grand mal seizure he has severe sharp headaches but does not vomit.

H. P. Patient has grand mal attacks previous to which things either dance up and down or a dark cloud appears before the eyes, shortly preceding a severe headache, all of which is of three or four minutes duration before a severe grand mal seizure. Patient occasionally, previous to the onset of the convulsion, has an aura of "numbness of the tongue."

M. M. (Dispensary Service, University of Pennsylvania Hospital). (Yawger, Journal of the A. M. A., October 17, 1914).

On July 22, 1903, at seven years of age, the patient was brought to the hospital because of spells in which "her eyes went up in her head" and she had "twitching of the nerves about her eyes." She returned February 4, 1910, and her mother stated that the child had no ambition and was drowsy and sleepy all the time. She had an occasional headache. The patient was having attacks every day in which she was unconscious, her eyes twitched and her hands moved restlessly, but she did not convulse. Previous to her convulsion she had a slight aura in the nature of a feeling of tightness and her speech became somewhat nervous. While under observation she had an attack during which she ceased talking, rolled her eyeballs upward and appeared as though going to sleep; there was also a slight

twitching around the corners of the mouth. The attack lasted 30 seconds. On December 7, 1912, the patient was again seen and complained of a typical migraine, having headaches one or twice a week, on which days her attacks increased in number. She would suddenly see a bright light like a gas light before one or the other eye. This would flicker and last for about 20 minutes, and in about five minutes after its disappearance she would have a severe headache of sudden onset lasting for about one-half hour. In 10 or 15 minutes she would feel very weak and begin to vomit, after which the headache would cease. Both eyes were never affected at the same time, and she could not see anything out of the affected eye and but little out of the other. At times the light would come from above, downward, and at other times straight at her. The tail was always to the outer side. The patient had occasionally a diplopia before the attack occurred.

THE CORRELATION OF CLINICAL AND SEROLOGICAL FINDINGS IN PARESIS AND CEREBROSPINAL SYPHILIS.*

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Considerable interest has, of late, been attached to the value of the Wassermann reaction in the differential diagnosis of general paralysis of the insane and cerebrospinal syphilis, and there appears still to be some divergence of opinion. In 1909, Ernest Jones[1] summed up the literature relative to general paralysis to date by saying: "A positive reaction (Wassermann) in the cerebrospinal fluid is strongly indicative of general paralysis, a negative reaction less strongly but unquestionably indicative of its absence; a positive reaction in the blood serum of a suspected case of general paralysis is of some value in support of the diagnosis, a negative reaction there is of much greater value in excluding such a diagnosis." Although many report 100 per cent positive findings in both blood and fluid, the above general statement is to-day probably more acceptable to the majority of workers than any more rigorous insistance upon constantly positive results. Nonne, in his book states: "Positive W. R. in the blood means no more than that the person has once been in contact with syphilis (hereditary or acquired), or that somewhere in the body a specific lesion still exists, but it does not mean necessarily that the disease in question must be luetic." And relative to the spinal fluid: "In the large majority of cases of general paralysis the W. R. is usually positive on using only 0.2 cc. of fluid, but in some few cases, and in most cases of cerebrospinal syphilis and of tabes, the W. R. is positive only on using larger quantities of cerebrospinal fluid." As typical findings he gives the following:

General paralysis:
Blood positive in 100 per cent.
Fluid positive in 90 to 100 per cent.
Cerebrospinal syphilis:
Blood positive in 70 to 80 per cent.
Fluid positive in 20 to 100 per cent.

* From material collected at the Warren State Hospital.

In these instances the smaller figures are for technique in which small amounts of the serum or fluid have been employed and the larger for that in which more is used. Several American writers, notably Kaplan, have insisted on the value of a negative W. R. in the cerebrospinal fluid in the differential diagnosis. He makes the following statement,[2] which perhaps represents the extreme viewpoint. "It is possible to differentiate serologically between paresis and cerebrospinal syphilis," and tabulates the difference as follows:

General paralysis:
Blood W. R. positive (rarely negative).
Fluid W. R. positive (rarely negative).
Cerebrospinal syphilis:
Positive or negative.
More often negative.

While examining the opinions given at staff meetings at the Warren State Hospital on 697 routine admissions, it was found that 87 (12.5 per cent) were considered to be syphilitic diseases. Of these 69 (9.9 per cent) were, in the opinion of the majority, unquestionable cases of general paralysis and 5 (0.7 per cent) were cerebrospinal syphilis. Concerning the remaining 13 cases (1.8 per cent) there was a diversity of opinion. By a more careful analysis of these cases it was determined that eight of the 69 paretics had had negative Wassermann reactions upon the blood, this being 11.6 per cent of all those suffering from this disease. Three, or 60 per cent of the cerebrospinal syphilitics also failed to show a positive reaction on the blood. In all these cases the W. R. on the spinal fluid was positive. As the value of such observations as these depends almost entirely upon the accuracy of the Wassermann technique I will quote the following from Paul G. Weston[3] as that used by him in all the cases reported here:

Wassermann Reaction.—The quantities of all reagents used were half those ordinarily used in the Wassermann test.

Complement.—The mixed serum from five guinea pigs was used. It had been three hours on the clot, one-half hour at 37° C., and two and a half hours at 5° C.

Hemolytic Amboceptor.—Antihuman rabbit was used. The unit was the amount that would cause complete hemolysis of 0.5 cc. of a 2.5 per cent suspension of washed human corpuscles in the presence of 0.05 cc. of the above described complement in a 2.5 cc. mixture in just two hours at the temperature of 37° C. Two units were used in each test.

Positive Control Serum.—Serum obtained from a case of paresis was used. It was inactivated by heating in a water bath at 55° C. for one hour.

Negative Control Serum.—A mixture of sera obtained from 10 non-syhilitics was used. It was inactivated by heating in a water bath at 55° C. for one hour.

Antigen.—Human heart muscle, free from pericardial fat, was ground in a meat chopper and covered with absolute alcohol in a wide-mouthed bottle. After 48 hours the alcohol was decanted onto a dinner plate and the tissue expressed between layers of cheese cloth. The expressed juice was added to the alcohol and the tissue returned to the bottle. The alcohol was evaporated by means of a current of air from an electric fan and the residue scraped up with a bone spatula and added to the tissue. Three volumes of absolute alcohol were then added and the bottle remained at room temperature for two weeks. At the end of this time the alcoholic extract was filtered off and to each 8 cc. was added 2 cc. of a 2 per cent solution of cholesterol in absolute alcohol.

Titration.—This antigen was non-hemolytic. The anticomplementary dose with normal serum was .15 cc. The antigenic dose was .00125 cc. The amount used in each test was .0125 cc. or 10 times the least antigenic dose, and one-twelfth of the anticomplementary dose.

Controls were carried for each reagent.

Spinal Fluid.—In all reactions 0.5 cc. of unheated fluid was used. The globulin was tested according to the method of Noguchi.

Cell counts were made by the Fuchs-Rosenthall method Five drops from each pipette were counted.

All the reactions mentioned as positive were + + + +.

As the number of cases observed here is small, it seems worth while to present somewhat in detail those in which the laboratory findings are of the most interest.

Cases Diagnosed Paresis in which Blood W. R. was Negative.

Case No. 1, Hospital No. 6834.—Patient male, aged 43, laborer. History of syphilis "many years" ago. Psychosis began when 40 years old with abrupt change of disposition, morose manner, talkative and expansive delusions. Physical examination showed equal, irregular, spastic pupils, unequal knee reflexes, sensory disturbances, incoordination, slurring speech and washed out facial expression. The one specimen of the blood taken was negative to the Wassermann. Of eight spinal fluid examinations the Wassermann reaction was seven times positive and once negative. Globulin positive once, negative seven times and the cells varied from 13 to none. Death occurred two years and eight months after the onset. At the post-mortem examination the diagnosis of paresis was confirmed.

Case No. 2, Hospital No. 8201.—Patient male, age 46, lumber dealer. History of syphilis six years ago. Five months before death he became irritable and complained of indefinite illness. Six weeks later he suddenly

became much confused, had vivid visual hallucinations, strong auto-accusatory trend of thought and delusions of persecution. During his hospital residence of two months consciousness was clouded, disorientation was complete, and he was restless, conversed incoherently and expressed many vague changeable delusions of a persecutory and somatopsychic nature. Physical examination showed muscle tremors, incoordination, slurring speech, areas of anæsthesia, Argyll-Robertson pupils, hyperactive knee reflexes and relaxation of the facial muscles. One specimen of the blood and fluid was taken. Wassermann reaction negative in the blood, positive in the fluid. Globulin positive and cell 40 per cubic millimeter. Two months after admission death occurred and the autopsy confirmed diagnosis of paresis.

Case No. 3, Hospital No. 8066.—Patient male, age 44, musician. History of syphilis when 36. Psychosis began when 41 years old with failure to attend to his work, forgetfulness, delusions of grandeur, and gradual general mental delapidation. Physical examination showed positive Rhomberg, muscle tremors, Argyll-Robertson pupils, hyperactive unequal knee reflexes, slurring speech and washed out facial expression. Two specimens of blood were negative to the Wassermann test but after a .45 gm. dose of neo-salvarsan, with Swift-Ellis treatment seven reactions taken over a period of two years were positive. Eleven specimens of the fluid were all positive to the Wassermann; eight were positive and three negative to the globulin test and the cells varied from 70 to none. Death occurred two and a half years after admission and the autopsy confirmed diagnosis of paresis.

Case No. 4, Hospital No. 8195.—Patient male, age 57, business man. History of syphilis 20 years ago. Psychosis began when 54 with change of disposition, gradual loss of business capacity, speech defect, vague persecutory delusions and gradual dementia. Physical examination showed muscle tremors, incoordination, Argyll-Robertson pupils, and hyperactive knee reflexes. Wassermann reaction on the blood negative, on spinal fluid positive, globulin positive, and cells four per cubic millimeter. Death occurred three months after admission and permission for autopsy was refused. However, our diagnosis of general paralysis of the insane is corroborated by similar diagnosis made at the Sheppard and Enoch Pratt Hospital just previous to admission here.

Case No. 5, Hospital No. 8705.—Patient male, age 52, teamster. No history of syphilis. Psychosis developed at the age of 51 with wandering tendency, rambling incoherent conversation, expansive delusions, inability to accomplish simple tasks and defective orientation. Physical examination showed slightly spastic gait, muscle tremors, Argyll-Robertson pupils, hyperactive knee reflexes, slurring elision of speech, and ironed out facial expression. Two specimens of blood taken with an interval of three months were negative to the Wassermann test. One month later a positive reaction was obtained. The spinal fluid gave a positive Wassermann reaction, positive globulin, and contained five cells per cubic millimeter. The "Goldsol" curve was of the paretic type. Diagnosis paresis.

Case No. 6, Hospital No. 7597.—Patient male, age 44, fireman. No history of syphilis. Psychosis developed at the age of 39 with diminishing capacity for work, insomnia, poor impressibility of memory, judgment defect, grandiose trend of thought, and lack of insight. A physical examination showed muscle tremors, unequal irregular pupils that reacted poorly to light but well to accommodation, equal but hyperactive knee reflexes, slurring speech and washed out facial expression. Three specimens of blood taken at an interval of one year were all negative to the Wassermann test. Five tests were made on the spinal fluid and all gave a positive W. R.; with globulin positive three times, negative twice; cells varied from 60 to none. Diagnosis paresis.

Case No. 7, Hospital No. 8187.—Patient male, age 48, salesman. History of syphilis at the age of 20. Psychosis began at the age of 45 with excessive worry over possible results of his early syphilitic infection, which at last became so great as to prevent work and sleep. Made several weak attempts at suicide. Physical examination showed slightly spastic gait, speech defect, pupillary margins irregular and reaction to light impaired and hyperactive knee reflexes. The blood was negative to the Wassermann reaction on six tests. The spinal fluid was at first positive; became negative after Swift-Ellis treatment and then was persistently positive in spite of further treatment. Globulin was positive in the first four tests and negative the last three; cells varied from 24 to none. Patient taken home against advice and has since committed suicide.

Case No. 8, Hospital No. 8102.—Patient male, age 47, oil-producer. History of syphilis when 19. Psychosis began at the age of 43 with excessive desire to eat and sleep, then a sudden onset of great confusion, restlessness, careless habits, poor memory, and a grandiose trend of thought. Physical examination showed positive Rhomberg, sluggish knee reflexes, irregular pupils that reacted poorly to light, muscle tremors, slight speech defect, and washed out facial expression. Two specimens of blood have given negative Wassermann reactions and the single fluid taken was positive. Globulin positive; cells four per cubic millimeter. Diagnosis paresis.

Cases Diagnosed Cerebrospinal Syphilis.

Case No. 9, Hospital No. 8571.—Patient male, age 16, school boy. No history of syphilis and both parents have Wassermann negative blood. Normal intelligent child until failing vision began at the age of 12, resulting in a complete optic atrophy a year later. A gradual dulling of all mental faculties began at 13, and resulted in a deep dementia by the time he was 16. A cerebral episode followed by transient loss of speech occurred when he was 15. In walking he took short uncertain steps, moved sideways and tended to travel in circles. Hands were tremulous, he was resistive but not spastic, knee reflexes normal, no pathological reflexes, expression that of an idiot, pupils unequal and failed to react to light or accommodation. W. R. on both blood and fluid positive twice; six weeks

interval. Globulin was negative once and positive once; cells three and six respectively. "Goldsol" curve of the paretic type. The autopsy confirmed the diagnosis of cerebrospinal syphilis.

CASE No. 10, HOSPITAL No. 7854.—Patient male, age 55, traveling salesman. History of syphilis about 25 years ago. Onset at 53 with the sudden development of great weakness of the right leg, hysterical worry and irritability. During his hospital residence he had several convulsions, all confined for the most part to the right side, and following each there was a more marked paralysis of that side. Organic reflexes became impaired and during the last few months a slowly developing weakness of all the muscles was observed. At that time there was a right ankle clonus, Babinsky and Oppenheim; all other deep reflexes much exaggerated on both sides, pupils irregular and reacted poorly and sensation changes were questionable. Failing memory and a suggestion of aphasia were the prominent mental characteristics. Wassermann reactions; blood negative, fluid positive. Globulin positive, cells three per cubic millimeter. Autopsy showed cerebrospinal syphilis with focal lesions.

CASE No. 11, HOSPITAL No. 8149.—Patient male, age 35, boiler maker. History of syphilis at the age of 25. Optic atrophy began at the age of 31 and shortly after that he showed a change of disposition being irritable and subject to periods of very unreasonable anger. No distinct mental disturbance demonstrated while at the hospital. Physical examination showed optic atrophy, sluggish knee reflexes and stiff pupils. Wassermann reaction on the blood positive. Six specimens of the spinal fluid taken over a period of 10 months all gave a positive Wassermann reaction, globulin always positive and the cells varied from three to 100. Diagnosis cerebrospinal syphilis. (The possiblity of a later development of taboparesis must be considered in this case. Present symptoms do not justify such a classification.)

CASE No. 12, HOSPITAL No. 8231.—Patient male, age 40, farmer. History of syphilis when 14 years old. When 37 years old he suffered a transient paralysis of both arms. At 39 he had a transient paralysis of the right side of the body. Four months after this sudden paralysis of all four extremities, the muscles of articulation and of deglutition developed. He was unconscious only at the time of the last stroke. This last condition cleared up after a few months except for the muscles of articulation, and during the year that he was under observation he was unable to speak but conveyed ideas clearly by writing. Conduct previous to admission suggested delusions of infidelity and of jealousy, but the presence of these was always questionable. Physical examination showed deviation of the tongue to the left, residuals of a right hemiplegia, paresthesia of the right leg, slight muscle tremors, and paralysis of the laryngeal muscles. Wassermann reactions; blood negative, fluid positive. Globulin test positive, cells five per cubic millimeter. Diagnosis, cerebrospinal syphilis.

CASE No. 13, HOSPITAL No. 8200.—Patient male, age 63, insurance agent. History of syphilis at the age of 39. Beginning at the age of 47 he suffered necrosis of the nasal bones and severe headaches for a period

of two years. When 55 he began to have dizzy spells and transient attacks of monoplegia. Eight months previous to his death the physical disturbances witnessed here began, accompanied by disorientation and clouding of consciousness and several very vague autopsychic delusions. Physical examination showed partial paralysis of both legs, the left being the weaker, and both being a little spastic, impaired vision and hearing, muscle tremors, some difficulty of deglutition, hyperactive left patella reflex, left Babinsky, double Oppenheim, and unequal pupils that reacted well. Wassermann reactions; blood negative, fluid positive. Globulin test positive; cells two per cubic millimeter. Autopsy was refused. Diagnosis cerebrospinal syphilis.

SUMMARY TABLE.

No. Case.	Paresis.						
	Blood.		Spinal Fluid.				
	W. R.		W. R.		Globulin.		Cells.
	+	−	+	−	+	−	
1	0	1	7	1	1	7	13 to 0
2	0	1	1	0	1	0	40
3	7	2	11	0	8	3	70 to 0
4	0	1	1	0	1	0	4
5	1	2	1	0	1	0	5
6	0	3	5	0	3	2	60 to 0
7	0	6	6	1	4	3	24 to 0
8	0	2	1	0	1	0	4

No. Case.	Cerebrospinal Syphilis.						
	Blood.		Spinal Fluid.				
	W. R.		W. R.		Globulin.		Cells.
			+	−	+	−	
9	2	0	2	0	1	1	3 to 6
10	0	1	1	0	1	0	3
11	1	0	6	0	6	0	3 to 100
12	0	1	1	0	1	0	5
13	0	1	1	0	1	0	2

Figures represent the number of positive or negative reactions in the individual cases.

Summary.—In the series of routine cases presented here:

1. A positive W. R. in the blood seems to be the rule, but even repeated negative findings do not exclude a diagnosis of paresis.

2. The blood W. R. may or may not be positive in cerebrospinal syphilis.

3. A positive W. R. was found in the spinal fluids of all paretics and cerebrospinal syphilitics.

4. The globulin reaction was very inconstant in both conditions and of no aid in the differential diagnosis.

5. The cell count varied greatly in both conditions, but was as great in one as in the other.

6. The five cases of cerebrospinal syphilis with uniformly positive W. R. in the spinal fluids, two positive and three negative bloods, show clearly the difficulty in diagnosis by laboratory methods alone.

7. Cases three and five demonstrate the necessity of making a series of tests whenever possible.

8. Experience with these and many other cases inclines the authors to believe that all the bloods here reported as negative would have given positive reactions to the Wassermann test if there had been an opportunity to make a series of tests.

9. Satisfactory diagnosis can only be made when the clinical and laboratory findings are considered together.

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THE FUNCTIONS OF A PSYCHOLOGIST IN A HOSPITAL FOR THE INSANE.*

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The functions or duties of an employee of a mercantile establishment have to a great extent been determined or limited by custom. This statement applies particularly to those who are members of trades unions but it is also applicable to most other workers. The individual who is employed as a porter, or as a bookkeeper, or as a salesman, or as an overseer, is, if he has had any previous experience in such a position, the possessor of knowledge regarding the general duties which he may be called upon to perform, or the tasks which may be required of him. There is, we may say, a social understanding of his general relations to the community with which he becomes connected. Recently, on account of developments in the industrial world older conceptions of the duties of employees have undergone considerable change in certain businesses, and in an up-to-date business each and every employee has the ideals of the establishment set before him. In the department store, for example, the porter not only loads and unloads, and transfers to different parts of the building, cases of goods, but if he has properly absorbed the ideals of the store, he continually seeks to discover means of preventing waste, and at the same time he becomes a potential seller of merchandise. In the factory advancing along modern lines the bookkeeper concerns himself not only with invoices and bills and costs and income, but he becomes a factor in increasing the output of the plant, in bettering the quality of the manufactured articles, and in devising means for enlarging the uses to which the establishment may be put.

Speaking broadly, the above considerations should hold for the functions and duties of a psychologist in a hospital for the insane. There is the distinction, however, that there is no extended period of time and there is no extensive number of those who have been

* Read at a joint meeting of the American Psychological Association and Section H of the American Association for the Advancement of Science, San Francisco, August 5, 1915.

employed as psychologists in institutions for the insane, and we cannot appeal to history or to tradition, and not much to custom, to set the limits or breadth or character of the functions of the psychologist in this possible line of endeavor.[1] We are, therefore, forced to seek elsewhere for the conception of his functions. This is to be found in the hospitals themselves.

A number of years ago the late Dr. Weir Mitchell became unpopular in psychiatric quarters for a time by his characterization of the institutions for the insane as huge caravansaries or boarding-houses. The critical observer at the present time may well wonder whether or not Dr. Mitchell's animadversions had produced any lasting effect. It is apparent that many of our asylums, some of which are masquerading under the name of hospital, have not advanced beyond the stage of belief that the main reasons for their existence are to protect the patient against his own anti- and unsocial acts, to protect the community against the possible misdemeanors of the patient, to see that the patient if he is not bodily ill does not become a total burden upon the state by keeping him occupied with some harmless but value-producing occupation, in some cases to record his history and make a diagnosis when his condition conforms to text-book accounts, and to prescribe suitable doses of cathartics and other simples when such drugs appear to be needed or are asked for by the patient.

[1] The history of the employment of professional psychologists in institutions for the insane forms an interesting chapter in the history of the development of psychology in this country, which cannot be dealt with in detail at this time. Several important events may be mentioned. President G. Stanley Hall while Professor of Psychology in the Johns Hopkins University was superintendent of a public asylum for the insane in Baltimore. Dr. Boris Sidis was associate in psychology and psychopathology in the Pathological Institute of the New York State Hospitals when it was under the direction of the late Dr. Ira Van Gieson, but his employment was objected to by the State Commission in Lunacy (judging from the reported communications between Dr. Van Gieson and that body). For a subsequent period of a dozen or more years no such non-medical psychological investigator was employed in that institute. It is also of interest to note that although the psychological aspects of insanity have recently been emphasized (perhaps over-emphasized), the employment of professional psychologists in psychiatric institutes in this country is not only far from general but rather the exception. The demands for a specific "medical psychology," whatever that may be, and perhaps also a reaction against the type of popular psychologizing in some quarters are probably responsible in large part for this state of affairs.

The steward, or financial officer, of one of our larger institutions for the insane, one with over 2000 patients, is reported to have recently said that with the aid of a good physician he could carry on the work of the institution in a proper manner and one which would fulfill its functions.[2] Such a statement indicates a view held not only by some of the laity regarding the functions of hospitals for the insane, but at the same time mirrors the medical ideas of many physicians regarding the places in which the insane are incarcerated. The term incarcerate is used advisedly in this connection, for although it has become customary to designate such places hospitals, in many cases they remain far from hospital ideals and far from the practices of the general hospital to which they are supposed to conform. It is not an exaggeration to say that many of the institutions for the insane in this country remain at the boarding-house stage which was so aptly characterized and condemned by Dr. Mitchell, and signs are present that in not a few cases the institutions are not kept up to good boarding-house standards.

In institutions such as have been described the psychologist as a psychologist could have no function, for he would be neither jailor, nor physician, nor bookkeeper, nor cook. In such an institution he could do only what could be done by any other intelligent, sympathetic, scientific layman, or by a wide-awake physician. He could note the lack of interest in the purely medical problems, he could see the routine methods of dealing with the patients as cases rather than the scientific and progressive method of considering them as individuals, he would have forced upon his notice the exaggeration and almost exclusiveness of the importance of the bookkeeping of the institution, and he might observe with wonder the general lack of those ideals and practices which make for medical advance in the understanding and care and treatment of those who, because of their infirmities and for social purposes, are deprived of their liberty and committed to the care of the institution. At the same time, as an intelligent citizen, he might be able to raise his voice in protest against the travesty of institutional care and treatment, and in that way his efforts might be of value. As a

[2] One is tempted to ask sarcastically why a physician should be added to the staff of such an institution. He would appear to be an unnecessary luxury.

psychologist, supposing he were employed through some misadventure, his functions could not be like those of any other psychologist in the world.

It is only in those institutions in which there exist the highest ideals of the functions of the institutions toward the community at large as well as toward the individual patient that the psychologist may rightly be employed and carry on work. For the understanding of the possible functions of the psychologist one must seek, therefore, for the ideals of the hospital, one must consider what the most advanced institutions are striving to do, and then we shall be able to discover whether or not there are peculiar functions for a psychologist in an institution for the insane.

The public, or semi-public, institution for the insane has officially the function of caring for, protecting, and treating the special diseases of its patients, and of segregating the patients so that they do not disturb the peace and comfort of other citizens. These funcions are not, however, the only functions of a hospital for the insane, for although not often specified in their charters or in the legislative acts of establishment the hospital exists also to perform other duties and to fulfill other obligations to the community. These duties and obligations are those which refer to the advancement of our knowledge regarding mental diseases, their relationships, their origins, their treatment, and their possible prevention. This means that the rightly named hospital for the insane has as its aim not solely the housing, the feeding, and the treatment of its patients according to current widely-accepted views, but also the scientific attitude of inquiry regarding the nature, the course, and the outcome of the different diseases. It is only in institutions in which the spirit of scientific inquiry exists that the psychologist may have functions apart from those of the physician, and the butcher, and the stenographer, and the host of other employees necessary for the conduct of an asylum.

It is only in those institutions in which in addition to a distinct recognition of obligation to care for the living patient there is also an expressed avowal to do all those things which will enable the institution to care for future patients more adequately in every respect and to serve the community, present and future, to the greatest extent, that a psychologist has a place. In such institutions the advancement of our knowledge of mental diseases is coordinate with the function of maintenance of patients. In them

the effort will be made to understand the patients, to discover all that can be discovered regarding the different diseases, and the effects upon the patients of advocated and supposititious therapeutic measures. The physicians in them will not contentedly wait for the knowledge of advance which is being made in other institutions, but they will be ready and anxious to cooperate and to do their part in the investigation of patients so that progress in the understanding of mental diseases may be made. In institutions of this kind investigation which will help toward the analysis of symptoms or conditions, or which may show relationships of genesis, or of effects, or which may give correlations of other kinds, is the goal. In this work of investigation the psychologist has a place on the same plane as the expert chemist, and the microscopist, and the serologist. The functions of a psychologist in a hospital for the insane may, therefore, be summed up in the one word investigation.

This is not the time or the occasion for suggesting specific problems regarding insanity which may be investigated by a psychologist, nor is it necessary to show in what ways psychological investigations by professional psychologists or by others have helped toward an understanding of the abnormal mental processes of the insane. It is more profitable to consider the general relations of the psychologist.

The psychiatrist as a physician is interested in disease forms, in their origins, in their courses, in their delimitation, and in their therapy. In other words, he is concerned with the combinations which are called diseases. His efforts as a physician are devoted to the diagnosis of the diseases and to the treatment of the patients. These interests of the physician are not the only ones he may have, but they are interests which pertain particularly to him as a medical man. In such matters the psychologist, as a psychologist, has little or no concern, and in so far as he exhibits such interest and occupies himself with them does he leave his psychology to wander into the adjoining field of the psychiatrist. But the same patients whom the psychiatrist examines for symptoms which will permit him to make a differential diagnosis and which will indicate to him directions for treatment are at the same time subjects of the psychologist's interest. The psychologist as a psychologist is, however, concerned not with the diagnosis or the genesis of the diseases but with the origin of particular mental events or pro-

cesses. He busies himself with the possible correlations of the mental states but not with them as combinations which point the way to differential diagnoses. The reasons for the incorrect interpretation of certain stimuli and the subsequent "normal" interpretation are points which he seeks to discover. He also desires to analyze those mental conditions which appear to change from day to day to see whether or not they have direct relations, and he wishes to observe and to compare the behavior of different individuals when subjected to the same forms and intensities of stimuli. The psychologist deals with the same material as the psychiatrist but from a different angle, and in so far as the psychiatrist takes the psychological view-point he leaves his medical speciality for an excursion into the adjoining scientific domain.

At the same time the psychiatrist is chiefly concerned with the possibility of the return of the patient to society. He seeks for means of changing the abnormal methods of function, which are called disease, into the more normal channels which will enable the patient to take up his work, his social duties, and his avocations. The psychologist in his investigations is not concerned with treatment and with cures or recoveries. He is interested in the changes from "normal" to "abnormal" and back to "normal" again, and he rightfully seeks to discover reasons for these changes. He may also investigate the gradual loss of certain mental capabilities, from "normal" to "decrease" to "loss," and may seek to discover means of retarding or of stopping or of altering the character of these abnormal variations in such individuals.

The psychologist's functions are principally to gather descriptive facts, to compare the abnormal with the normal, and when possible, to explain the relationships of specific mental conditions. This work entails not infrequently the investigation of the normal by methods which are applicable to the insane, and he must frequently seek confirmation or disproof of previous work by other methods on normal individuals. At the same time new methods must be devised to meet new situations, for the investigation of conditions which are found in the insane but apparently nor in normal people. Frequently new methods must be applied or devised to demonstrate when possible the relations of peculiar states of the abnormal to similar ones in the non-insane. He may also attempt to produce temporary abnormal conditions in normal people for the sake of determining facts which may help toward

an understanding of the more prolonged mental changes which make up a psychosis, and which are produced by exogenous or endogenous toxins, or by other physical or by mental events.

It is not only with those things which, strictly speaking, are to be called mental that the psychologist must deal. Above all he must be an investigator of mental things, and he must follow these wherever they lead. In his investigations of the insane he must be free to wander into the domain of the physical if the mental conditions he investigates appear to have direct relations with the physical. There has been a too frequent tendency of late years to overlook the physical or to push it to the background, or to erect a high artificial barrier against excursions from one side to the other. To the investigations of a psychologist in a hospital for the insane such barriers are harmful because there are ample demonstrations of the mutual inter-dependence of the physical and the mental. If he is to seek for correlations or for explanations, the physiological and the anatomical and the pathological facts must not be considered to be strangers, but they should be met and welcomed; sometimes they must be sought out when they are not at hand, and they must be given their due weight in the consideration of the mental.

In other words, if his work is to be fruitful in the discovery of new facts and new relationships which help to an understanding of the insane, the psychologist cannot be confined to a narrow strip of land, whether this strip be separated from other adjoining fields by wire fences through which he may look but over which he may not climb, or by high stone walls like those of a prison beyond which he cannot see. It is against a narrow view of the functions of a psychologist that we must exert our efforts, and it is because of the narrowness of some of the recent applied psychology that the science is deprecated by more than a few of our psychiatrists and neurologists.

This leads to a more specific consideration of some of the kinds of psychology. The functional and the analytic have too frequently been considered to be antagonistic, and in recent years it has been the fashion to magnify the importance of the functional and to minimize the value of the analytic. This has been done more especially by psychologizing psychiatrists whose conceptions of functional psychology, as judged by their utterances, consist in the frequent use of loose terms and in the grouping of suppositions

and so-called facts. To some devotees of the functional psychology the thorough examination of skin and organic sensations in a patient who gives evidence of having somatopsychic delusions may appear futile, since it is assumed that habits of thought, previous mental traumata, and a variety of other mental things are all-sufficient explanations of the delusional state. Critically it appears that by such psychologists the temporal sequence is frequently transformed (as a wish-fulfilment, it may be) into one of cause and effect. The terms psychogenesis, mental conflict and mental mechanism, psychic trend, and a variety of others are used without sufficient analyses of the conditions which they are intended to describe and without a clear definition of these functional terms. This is not to say that functional psychology is valueless. It is only to indicate that in my opinion not all of the so-called functional psychology is of value for the understanding of the insane, and, furthermore, that not all of the so-called functional psychology is psychology. It is probably best that some investigators attempt analyses and that others seek for functional relations, but for the understanding of mental events in the life of the individual both forms of psychology must eventually be used. The kind of psychology is of less importance than that the psychology be scientific.

One other function that a psychologist may have in a hospital for the insane merits brief mention. This is the creation or the advancement of a scientific attitude toward mental diseases in those who are entrusted with the care of patients. Although much has been said regarding scientific medicine, and much effort has been expended to bring about a more scientific attitude in physicians and surgeons, there remains much to be done before the scientific spirit of inquiry and of doubt and of directive effort at advance can be instilled into those who have charge of insane patients. It is, therefore, in his general relations to medical men that the psychologist (but perhaps in this respect not more so that any other investigator) can have a function in a hospital for the insane. By his questions, by his expressions of doubt, by his suggestions of new methods, by his criticisms of loose terms and false connotations, by his enthusiasm, and by his insistence upon the distinction between facts and speculation, the psychologist can, acting through his medical associates, play an important part in the development of psychiatry.

RECOLLECTIONS OF A PSYCHIATRIST.

By JAMES M. KENISTON, M. D.

In May, 1869, I received from Dr. John W. Sawyer an appointment as "assistant physician" at the Butler Hospital for the Insane, Providence, R. I. At this time I was just entering my last year in my medical course at Harvard. The requisitions for a medical degree at that period consisted of two full courses of lectures—on Anatomical Pathology, Anatomy and Physiology, Theory and Practice of Medicine, Surgery and Clinical Surgery, Chemistry, Obstetrics, and Materia Medica, and three years study with a preceptor. There was no entrance examination, and no test of any kind—all who applied were admitted. The lectures began in November and ended in April. On four days in the week we had six or seven lectures a day, and on two days we made a hospital visit with the attending physician or surgeon at the Massachusetts General Hospital. On Wednesdays and Saturdays we attended the operations in either that hospital or the Boston City Hospital. We also had the privilege of visiting the outpatients departments of these hospitals and the Boston Dispensary.

At that time only a fortunate few were able to get any practical hospital training, there being only six internes at the Massachusetts General Hospital, and about the same number at the Boston City Hospital. I never knew how these appointments—for one year's service—were made; but I do know that the appointees were good men. There certainly was no competitive examination.

After hearing the same lectures a second time, one could acquire a fairly good acquaintance with many of the subjects, especially if one did not neglect the ample material for dissections, and paid special attention to the clinical lectures and the autopsies. The hospital visits were not so satisfactory, as there were very many students, most of whom could not get near the patients. Personally, I got on fairly, by selecting—more or less at random—certain cases, and, after ascertaining their location, moving on to the particular bed or beds I desired.

Among the 12 professors whose names were on my diploma, I recall vividly John B. S. Jackson, pathologist, whose dissections I

have never seen surpassed. He was an enthusiast, never seeming happier than when he made an autopsy or displayed and interpreted morbid specimens. He was known to the irreverent students as "Morbid John." In the examinations, always oral, for the degree, his was always considered the hardest. I therefore managed to get to his chair first, reasoning that success with him meant probable success along the entire line. He was very kindly, and I have never forgotten his last words, as we changed seats in our progressive examinations. "You have done well, and I am sure you will pass all right. You have my vote."

Like all the other students, I not only was benefited by Oliver Wendell Holmes, but was at all times responsive to his wonderful charm. With him, bones were no longer dry, but things which combined the useful and the beautiful. His lectures and demonstrations were enlivened and illumined by numerous stories, and by spontaneous exhibitions of wit and humor. At our yearly receptions he was the center of an admiring throng, on whom he lavished his charming gift of speech, to our infinite delight and profit.

The third professor, to whom I owe most, if not all, such proficiency as I have attained in diagnosis, was Calvin Ellis. His summary of the symptoms presented by the patients brought before the clinic was exhaustive, and his analysis of them and the differentiation from other possible diseases covered the whole ground. On the single occasion when an autopsy failed to confirm his diagnosis, he said: "I made a mistake, but it was a mistake which ought to have been made, in the present state of medical science." And we cheered him.

We all loved Dr. George C. Shattuck—the good teacher, good doctor, and good man—whose unassuming Christian character and whose kindly interest helped many of us in our effort to season our learning with true manliness. The famous surgeon, Henry J. Bigelow, whose skill as an operator I have never seen surpassed and rarely equalled, held us all. He always was immaculate in appearance, and always operated in a Prince Albert suit. In those days germs were not, but scrupulous cleanliness prevailed. These were the men who deeply impressed me.

In addition to the lectures, clinical and didactic, medical students were obliged to study with a medical preceptor in the interim.

I was fortunate in securing a place with the late Dr. David W. Miner, of Ware, Mass. He had his office in a two-story building on the main street. On the lower floor he had a legitimate drug store, no patent medicines being kept or sold. On the upper floor were consultation and operating rooms, and a completely equipped dental office. I spent all my time for nearly two years with Dr. Miner, except, of course, the lecture terms. We—there were two of us students—were expected to put up prescriptions, and to make all the tinctures, pills, extracts, etc., needed to keep up the stock. In this way we learned our materia medica in the most practical way. We also assisted in filling teeth and making artificial dentures, and we also kept his accounts. After we had made some progress the doctor would take one or the other of us on his rounds. His circuit was very large, and we had a chance to witness the almost infinitely varied emergencies, and the call for rapid treatment with often crude implements, which circumstances often imposed on a country doctor. I once helped Dr. Miner set a very bad fracture of the thigh, and apply splints made from some old fence rails, our only tools a hammer and a pocket knife. This in a country house, some miles away. The result was perfect.

Such then were the lessons and experiences which seemed to justify the superintendent of the Butler Hospital in selecting a youth of 20 years as his assistant. I had taken the two lecture courses, had spent two years with a preceptor, and nearly three months at the summer school, Harvard. In addition to a high school course, and the senior year at Philips Academy, Andover, I had spent two years at Amherst, circumstances preventing me from completing the course. My home training was of the best. I learned to obey, and to perform thoroughly any task assigned to me. My father often said: "When given an order by anyone who has the right to order you always obey promptly, and, if you can, cheerfully, pleasantly, and willingly. If you do this you will deserve success. Also, never be ashamed or afraid to ask questions." I was also taught to be courteous to everyone, and especially to respect my elders.

Although I had two courses of didactic lectures on insanity by Dr. Tyler, superintendent of the McLean Hospital, I had never seen an insane person, as no clinical demonstrations were given, nor had I seen a hospital for the insane. It was, therefore, with

much trepidation that I went to Providence—many misgivings as to my prospects. But Dr. Sawyer put me at ease at once. He was not loquacious. His speech was usually laconic, but every word told. His diction was simple, but his vocabulary was large, and evidenced a wide acquaintance with the best literature, ancient and modern. His early tutelage under the famous Dr. Isaac Ray, and a subsequent service of nine years at Madison, Wis., fitted him for the vacancy caused by the retirement of the former. A modest, retiring man, he never sought publicity, but devoted himself wholly to his chosen work. A man of great force and determination, he was also most gentle in manner, "pleasant and kind toward all, yet there was about him, in his speech and actions, a current which could not be misconstrued, and which kept everything in and about the house in thorough discipline."

My predecessor, Dr. Samuel Worcester, remained for two days, to initiate me in the purely mechanical routine of hospital life, and then I was left to make my way as best I could. My duties were many and varied. First, of course, in importance was the care of the patients. During my first year the total number under care was 223, and our daily average was 151, which somewhat exceeded our capacity. In fact we were over-crowded. This was the trouble everywhere, and it still continues.

In 1869 all cases were recorded in large case books, and I devoted several hours daily to the study of the cases present on my entry. This, with at least two routine daily visits to the wards, soon gave me a fairly good working knowledge of the patients. The classification then in vogue was very simple, and vastly different to the more extensive, comprehensive, and systematic scheme now in vogue.

We had the various forms of mania and melancholia—acute, sub-acute and chronic—according to the exhibition and degree of exaltation or depression, and in addition general paresis and epilepsy. We also had a few cases of senile dementia. This rendered diagnosis comparatively easy.

I soon learned that giving a name to a given case of mental disease was relatively unimportant. No two cases of mania, for instance, were alike. Dr. Sawyer always laid great stress on the fact that we had to do with individual men and women who were sick, and not merely with cases. Hence we must always consider

the conditions of the body as well as the mind, and also the patient's spiritual state, so far as we could comprehend the latter. He also endeavored to learn the character and endowment of his patients prior to the onset of the psychosis, as well as their heredity and environment. Nothing was too trivial or insignificant to be considered.

As text books I had Bucknill and Tukes Manual of Psychological Medicine, Griesingers Mental Pathology and Therapeutics, and Conolly on the Treatment of the Insane. I also read Dr. Pliny Earle's Institutions for the Insane in Prussia, Austria and Germany. We had the AMERICAN JOURNAL OF INSANITY, the *Boston Medical and Surgical Journal*, and the *Medical Record*, which kept us in touch with current trends in medicine. The reports of the various hospitals for the insane contained an immense amount of valuable information and suggestion. Always an omnivorous reader, I devoured all I could lay my hands on.

After two weeks of hard study and hard work, Dr. Sawyer placed me in full charge of the wards, and I often made my regular rounds alone. He did not believe in a rigid and formal system of hospital service—in regulations and rules as fixed and immutable as the laws of the Medes and Persians. He held me to a strict responsibility for the condition and care of each patient, and required a daily report of any and all patients who were sick, or who manifested any special mental symptoms. But he did not order affairs by clock or gong. Owing to my many duties, of which more hereafter, I made my morning visit when most convenient. I proceeded leisurely, and endeavored to act as if I were making a social call rather than an official inspection. This was easy as the wards were comparatively small. As I became acquainted with my patients and learned their peculiarities and idiosyncrasies, I was better prepared to direct my conversation into appropriate and pleasant paths. Still more important, perhaps, was the knowledge when words were out of season. I did not care for the sick or excited on this round, having already done so immediately after breakfast. The main object of this morning round, and in fact of all our methods, was to make Butler Hospital as nearly like a home as possible.

On this round patients were encouraged to tell of their experiences, report their trials and tribulations, and express their wants.

While we had some indigents, the larger number of our inmates were private patients, and these latter, being in command of more or less ample means, naturally had more wants, real or imaginary. To gratify these whenever reasonable, or to refuse without giving offense, often proved a hard problem. I soon found, however, that perfect frankness and strict truthfulness usually made my way smooth. Nothing is more harmful to an insane person than a lie or deceitfulness.

In dealings with the insane one should not only display the greatest possible tact and consideration, but also know when firmness is required. These requisites are exactly those essential for the treatment of people sick with diseases other than mental, and are those always exhibited by successful physicians. Moreover, infinite patience is necessary, as progress is often slow, with many interruptions. Above all, one should not only feel but manifest the feeling of genuine kindness and love, as well as sympathy, hopefulness, and encouragement. Finally, one must really love his work.

In endeavoring to acquire and practice these qualifications I found in my chief the greatest assistance, the largest inspiration. When he saw me perplexed or disheartened, as I often was, he would say the one word needed, or perhaps only smile at me. But above all he made me feel that he trusted me. On rare occasions he would come to the office late in the evening and for an hour or more narrate to me his past experiences, or the doings of the leaders in our specialty, his whole discourse enriched by appropriate anecdotes and quotations. At such times he also gave me needed advice and counsel and encouragement. These interviews have always dwelt in my memory.

Dr. Sawyer was always dignified and courteous. In the discipline of the house he never resorted to petty maneuvers nor did he ever allow constant nagging of the attendants and other employees. Nothing takes the heart out of one so completely and quickly as continual fault-finding. He inspired his subordinates by encouraging them, teaching them the value and the necessity of co-operation, and now and then uttering a word of commendation.

At this period, notwithstanding the teaching and practice of Conolly, Tuke, and others, mechanical restraint was still in vogue at Butler, as throughout the whole country. At Butler, however,

it was reduced to a minimum, and was mainly used on patients who were either liable to injure or maim themselves, or in cases of extreme manic excitement. For example, one man with a broken leg constantly removed the splints, when his hands were free. He therefore wore a leather muff, which was fastened by a broad belt at the waist, and buckled behind, until the bone was firmly united. He could move his hands freely within the muff, but could not release them. At no point was there any constriction which would embarrass the circulation. Another patient was continually picking at her face and eyelids, causing unsightly and even dangerous sores. She therefore was obliged to wear soft thick flannel mittens, so arranged with a belt that she could not life her hands to her face. Often weeks and even months would elapse without any mechanical restraint. It seems unnecessary to remark that special care and nursing were given to patients in restraint.

We employed very little "chemical restraint"—narcotics and hypnotics being sparingly used. We occasionally gave a dose of opium or hyoscyamus which "was the only narcotic worthy of confidence as a substitute for opium." We also tried the bromides, but will little success, except in epilepsy. A favorite recipe with us was the old fashioned "red mixture" which contained the alcoholic extract of conium and the carbonate of iron. About the year 1869 chloral first came into use, and I first began its use on August 15, 1870, in the quantity then universally recommended, viz: from 30 to 60 grains a day, in divided doses. This caused a sound, refreshing sleep of six to eight hours. To-day I would not dare to give such quantities. But then I had no unfavorable results. I embodied my experience with chloral in my graduation thesis, which, to my great surprise but deep satisfaction, was published by the Medical Faculty in the *Boston Medical and Surgical Journal*.

Our treatment did not demand the excessive use of drugs. We employed the usual tonics, laxatives, etc., when indicated, in addition to the sedatives already mentioned. We laid more stress on suitable diet, baths, fresh air, sunshine, exercise, and above all the so-called and rightly named "moral treatment." This included all kinds of healthful occupations, especially out of doors, suitable and varied diversions, special entertainments, and religious services. As I could play on the piano and organ in an amateur way

I took charge of all the music. For nine months in the year we had the patients gather in the chapel on Tuesday and Friday evenings. On the former I gave an hour or more of readings. The first half hour was devoted to some instructive work, which was continued for successive weeks until finished. One book I recall was "Our New Way Round the World." Next came one or more poems, and finally some stories, usually of a humorous or diverting content. The patients often selected the poems and stories. At the beginning and end of each evening, as well as in the intervals between the parts, I played a piano solo.

On Friday evenings I gave a stereopticon lecture from our large collection of pictures. I made the oxygen gas myself, and instead of hydrogen used ordinary illuminating gas. These gases were contained in large, wedge-shaped rubber bags, kept in place by wooden frames, on each of which was placed iron bars of about 150 pounds weight. One evening, after the patients had left, I was inspecting and trying out the tubes, which had not worked satisfactorily, when the hydrogen bag exploded, throwing me about 12 feet into the corner of the room. I escaped without a scratch or bruise, although I was stunned and absolutely unconscious for about five minutes. One of the bars of iron was found within 10 inches of my head. The necessary repairs to the chapel postponed further entertainments for some weeks. Thereafter the gases were kept in galvanized iron tanks a long way from the chapel, and conveyed by metal pipes to the lantern.

Religious services were held on every Sunday evening. Dr. Sawyer read prayers and the sermon, while the choir, composed of employees and patients, furnished appropriate music. I held a rehearsal on Saturday evenings, as many of the choir could not read music, and by persistency we finally gathered quite a repertoire of church music, including a few simple anthems which we gave on special occasions. These services, simple and unpretending, were greatly enjoyed and appreciated by the patients, and in fact by the entire household. Since my day various local clergymen conduct these services.

Other sources of benefit to the patients may here be mentioned. Ray Hall, so named in honor of the first superintendent of Butler Hospital—the famous Dr. Isaac Ray—with its museum, billiard table, bowling alleys, etc., was in use on every week day. A large

and carefully selected library, to which annual additions were made from a library fund of $1600, was well patronized. On frequent occasions a carriage was used to convey patients about our beautiful and spacious grounds. Walking parties were numerous. The hospital faced directly on the Seekonk River, which at this point broadened out into what was practically a small lake. The main road was far away—out of sight—in the rear, and we were seldom annoyed by curious intruders. A delightful feature was the "Grotto," in a ravine left largely unadorned except by nature. Through this ran a brook, which in a suitable location about midway between the highway and the Grotto, was dammed, forming a pond of about one acre. There were several groves of beautiful trees, many of them very large.

To make effective both the medical and moral treatment we endeavored to carefully select the men and women who should have the immediate care of the patients. At this time all of these were called attendants, this custom prevailing even to-day in some hospitals. None of them were called nurses. They acted as nurses and ward maids or orderlies. They scrubbed floors, served meals, and in short had a host of functions and duties entirely apart from attending. To those familiar only with the scientific hospital of to-day (I am of course referring to hospitals for insane) such methods would be abhorrent, and they would not believe that satisfactory results would follow. But they did. Somehow or other, many of these attendants did noble work, and our proportion of recoveries and improved need not fear comparison with those of the present time. The modern training-school for nurses had not appeared, and, so far as I knew, had not even been contemplated. One reason, in my opinion, why we got such good results was the fact that each attendant had only a small number of patients to care for. In the acute service we averaged one attendant to four or five patients. Again, we had two mature and efficient supervisors, who like the attendants, lived on the wards both day and night. Finally, the writer spent several hours daily on the wards, and often joined the card parties on the free evenings. Nor must I forget how Dr. Sawyer daily appeared here and there, entirely apart from his regular official visits.

One would suppose it would be difficult to find, still more so to hold attendants for any length of time. This was not the case.

Many, very many, of our attendants had been at Butler for years, and some were still there when I left. We always had a large waiting list. The greater number of our attendants came from Maine, and very capable and as a rule thrifty they were. It was said of one particular town that every boy and girl looked forward to hospital work for a few years in order to accumulate a modest capital which would enable them to buy a farm or start some kind of business. I managed to keep track of many of them in after years and was glad to learn that they were prospering. I know of some families in this particular town where three generations have engaged in this line of work. In my present location I have had two brothers and two sisters in charge of the wards under my care. All of them are living, happily married, and prosperous. These men and women were usually shrewd and typical people of the old-fashioned New England type. They were willing workers, eager to learn, and were soon taught all the essential elements of nursing the sick, which need no description here, as they are well known to the laity. While I had only minor surgery during my tenure, I did have quite a number of severe medical cases, such as acute articular rheumatism, pneumonia, tuberculosis, and so on, and in every case the patient was well and properly nursed. The clinical thermometer had just come into use, and I had bought Wunderlich's book. Very soon these nurses could use the thermometer and record its readings as well as they could count the pulse and respiration. As I dwell on those days of long ago I must repeat that our attendants as a rule developed marked ability in the care of the sick. I must also say that I believe thoroughly in the modern properly managed training-school for nurses in all hospitals for the insane.

I may now enumerate some of my many duties at the Butler Hospital. In the first place all the accounts, except the banking, fell to me. I received all new patients and entered their names in the proper books. Our system of bookkeeping was simple but clear. In our "scratch book" every transaction or obligation was entered, to be recorded in the journal at the end of each day, charged to the proper accounts, and finally transferred to the ledger. Every day, in addition to the standard supplies—the commissary department—we had numerous articles purchased for the private patients, such as books, haberdashery, delicacies, etc.

These all had to be entered on the patient's personal accounts. Every three months bills had to be rendered for each patient, and copied in a special book by letter press. On the expiration of each quarter I had to prepare a trial balance, which was duly inspected and verified by the auditing committee and treasurer. When the accounts were approved, I was allowed a vacation of three, and, in one instance, four days.

In those days tablets, triturates, and capsules were not, and very few pills were kept in stock by druggists. We had a comparatively small "medicine closet," which I was expected to keep supplied. I made up most of the tinctures, solutions and extracts, and even rolled pills on occasions. A tray containing small tumblers of the medicines prescribed went out to each wing three times a day. Very little alcohol in any form was given, and that usually to a few very old and feeble patients. In fact, we used very small quantities of drugs, relying chiefly, as said before, on hygiene, exercise, and moral treatment. Hence my duties as pharmacist were not arduous, my experiences with Dr. Miner having made me a comparative expert.

Another duty was to take out parties in the carryall for occasional drives about the grounds. I usually made three trips in the afternoon. On occasion Dr. Sawyer relieved me in this. These trips were made once or twice each week. I also drove to town two or three forenoons each week to make purchases for the house or the patients. In these trips I was often accompanied by the matron, who always provided for the wants of the female patients. Either Dr. Sawyer or I went to town every week day to get the mail.

It was my duty also to distribute and send to the wards all mail matter, and to censor every newspaper, magazine or other literature. I had to cut out all death notices, murders, acts of violence—in short all crimes and anything else which might excite the patients, and either hinder their recovery or increase their irritability or depression! The papers looked like a coarse sieve by the time I had finished. This task was hateful to me, and I received much hostile criticism from the patients affected by this censorship. I would not have minded this, had this antiquated method been effectual. On the contrary many reports of deaths and crimes reached patients in some way or other, perhaps through

visiting friends. We also tried to conceal the deaths of our inmates, thus causing all sorts of horrible conjectures to those left behind. At that time I *felt* we were making a mistake, and now I *know* it. Except an untruth, nothing is so harmful to an insane person as the attempt to conceal from him matters which are liable to happen at any time. Now, as for many years past, whenever one of my patients passes away, I notify all the other patients on the ward, and explain the nature or name of the illness which caused death. I was led to this by the following incidents: A young woman died of pneumonia, and we endeavored to have the body removed surreptitiously. A few days after a patient said to me " Did you kill —— and cut her head off? Last night I heard her head bumping and rolling down the stairs and you said, ' I've got Mary's head, now roll down another.' "

Later, in another building, I was unable to find a nurse on a certain ward. The entire ward was apparently deserted. Finally I heard a voice from a dormitory. " Is that you, doctor? Miss T. has gone to lay out Jane ——. They have locked us all up in this dormitory, and think we don't anything about it, but we all do." Further comment seems superfluous.

Another duty was to help amuse or interest patients in ways entirely different from the stated entertainments, and to act as instructor. I taught the use of wands and grace hoops, outlined methods of study or courses in reading, visiting often the comparatively small number engaged in mechanical pursuits—farm, garden, sewing-room, etc., and often took some of the men on special " hikes."

I also had to furnish a daily weather record. Morning, noon and night I recorded the wind, temperature and barometer readings, and measured the rain or snow when we had any. These records were tabulated once a month, and were printed in the *Providence Journal*. They were often found very valuable.

Perhaps a description of one day's routine may be of interest. Rising bell at 6.30 a. m., breakfast at 7 a. m. At 7.30 a. m., preparing and sending out medicines and attending to the sick. 8.30 a. m. to 10.30 a. m., regular morning rounds, making out bills, answering letters, or writing in case books, often interrupted by visitors who inquired about the patients' condition. About 10.45 a. m., drive to town—three miles—with matron, to hunt up help,

purchase goods and so on. Get the noon mail, reach hospital on our return at 1 p. m. Distribute mail, mutilate newspapers, etc., until 1.30 p. m. when we had dinner. After dinner, office work for two hours, and then drives about the grounds—usually taking three trips. From 5 to 6 p. m. I had usually some leisure, which I devoted to my medical studies. At 6 p. m. we had supper, after which I tried to get a short walk. From 7 to 10 p. m., keeping office, where I often found much work to do. If no hospital work was at hand I studied until 9 p. m. and then read for an hour for recreation. It is almost needless to state that in 10 minutes after I left the office for the night I was sound asleep. I needed all the sleep I could get.

Nevertheless my long and busy days did not exhaust me. My work was so varied, my health so perfect, my enthusiasm so permanent, my surroundings so agreeable, the food so excellent, and my joy in service so genuine, that I always felt happy and strong. Dr. Sawyer was as busy, for as many hours, although in a different way. It was a real pleasure to work for and with him.

I may unintentionally have conveyed the impression that I did nothing but work, that there was no time for play. Now seems the proper occasion to describe some of my recreations and pleasures.

First of all I had a large library of well-selected books at my disposal, and I had access to the Athenaeum, where I spent many pleasant and profitable hours while waiting for the matron to finish her errands in town. Occasionally I would spend a whole afternoon there. I always took a long look at Malbone's famous miniature of "The Hours." I read the leading English and American reviews and magazines. Here I found much of my material for my readings to patients.

In the next place my slight knowledge of, but intense love for, music afforded me both pleasure and profit. One of our patients was a proficient and accomplished pianist, and he gave me valuable instruction. His reportoire was very large, ranging from Bach and Beethoven to Weber and Wagner. When in the mood he would play for me by the hour, especially on Sundays, when my only duty apart from my rounds was the evening service. I shall never forget his interpretation of Beethoven's sonatas, many of which he played from memory. Thus my two great and abiding hobbies—literature and music—had full scope.

Another man—a paranoiac—had his own private library in his room, and, as from the beginning he took a liking to me, I had the benefit of his remarkable erudition and culture. He had his meals in his room, as he would not associate or even converse with any of his fellow-patients and attendants. He introduced me to the English poets and essayists, as well as to many of the great masterpieces of the most noted and learned divines. He was an ardent and devoted churchman, and on Sundays he would only read or talk about the works of the leaders. I cannot recall all the books he induced me to read, but I know I specially enjoyed, and do to this day, Keble's "Christian Year," and Jeremy Taylor's "Sermons" and "Holy Living and Dying." On rare occasions he would consent to go out doors, and then we would take long walks into the country.

On Sundays I often attended the morning service at the Central Church, where I was sure of a good sermon and fine music. I also occasionally attended social affairs during the week—but only occasionally, and on one never-to-be-forgotten evening I heard the Thomas Orchestra. When I found I could go, it was just one-half hour before the performance, and as there was not time to have the carriage sent up, I ran the entire three miles, arriving just as Thomas raised his baton, and his orchestra began the Fifth Symphony.

In the fall of 1869, I had to transfer a patient to the Government Hospital for Insane at Washington. A veteran of the Mexican War, a courteous gentleman of the old school, he said as we started, "If you will treat me as a companion and not as my keeper, I pledge my word of honor I will cause you no trouble, and will not attempt to escape." I agreed, and he kept his word. Provided with ample funds, and instructions to humor the general, we took the night boat for New York. In the morning we had breakfast at Delmonico's, and then had a carriage drive through Central Park. After lunch we called on one of the general's relatives, who gave us tickets for the afternoon concert of the Philharmonic Society. We made some more calls, had a late dinner, and then took the night train for Washington. We reached the hospital in time for breakfast. I spent the day in inspecting the hospital, White House, Capitol and Smithsonian. On my return I spent a day and a half with Dr. Isaac Ray, at his home in Phila-

delphia. I was glad to find that this very learned man and profound thinker was also fond of "a little nonsense now and then," and a well-worn copy of Lear's "Nonsense Book" was lying on his library table. In the evening his son took me to hear Thomas' orchestra.

One of my greatest pleasures, in addition to my daily companionship—for such it was—with Dr. Sawyer, was my opportunity to meet some of the most eminent alienists of that period. Dr. Isaac Ray made several visits to Butler Hospital, and I had many interviews with him. At this time he was about to issue his Medical Jurisprudence of Insanity. I also met Drs. Kirkbride, Butler, Nichols, Walker and Godding, and profited by their wisdom and counsel. All these have passed away, but their names are emblazoned in the annals of psychiatry, and are held in grateful remembrance by the few now living who had the privilege of knowing them. Their annual reports are alive and fresh and helpful even to-day. It was my loss that I never met Drs. Woodward and Earl.

As I look back on those days, I find I have forgotten most of the uncomfortable or disagreeable things which inevitably accompany a life among the insane. Some dangers there were, and once I nearly lost my life at the hands of a dangerous maniac. What stands out with increasing clearness each year is the fact that I found my greatest pleasure in endeavoring to render service, and that I left at the close of my more than two years of office many kind and true friends.

My association for nearly four years with Drs. Miner and Sawyer proved invaluable to me on engaging in general practice. I had learned to meet "all sorts and conditions of men"; to cultivate tact, patience, and forbearance; to sympathize with the afflicted; to control my temper, naturally fiery; to obey and to command; and to submit more or less cheerfully to restrictions often onerous. Although then, and even now, prone to periods of depression, on the whole I became an optimist, and such I still remain.

Finally, my experience at Butler Hospital enabled me to supplement my practice by many consultations in cases of mental disorders, which proved interesting as well as financially profitable, as no other physician in Cambridge had any practical experience with the insane.

DANGERS OF THE CONTINUOUS BATH.

By WILLIAM A. WHITE,
Superintendent Government Hospital for the Insane, Washington, D. C.

I am prompted to write these few words of warning by having recently noted that in a sister institution a patient was scalded to death in the continuous bath. It is not altogether clear from the account that I saw of this accident what happened, but I suspect very strongly that the patient was fastened in the tub and during the few minutes' absence of the nurse to attend to pressing duties elsewhere the water suddenly raised in temperature and she was unable to escape. This brought home to me in a most emphatic manner what I believe to be an entirely wrong practice which has grown up in connection with the continuous bath.

In my visits to the various institutions I have noted, I might almost say, a universal practice of fastening the disturbed patient in the tub. There are various devices for doing this, the most common one being the canvas sheet which is fastened over the top of the tub, usually by straps which go under the bottom and are therefore inaccessible to the patient. Another method which I have seen is by the combination of canvas sheet and camisole, the sheet fastened over the tub and the camisole receiving the arms of the patient. Any of these devices make such an accident as I have above mentioned a possibility. Devices for securing even temperatures of water are apt to get out of order and cause the water suddenly to heat, and if contemporaneous with this the nurse should leave the room, and sometimes she is forced to by circumstances even though instructed not to, an accident may happen. I think the only adequate precaution to take against this type of accident is to insist that ***under no circumstances is a patient to be fastened in the continuous bath.***

The practice of fastening patients in the tub has grown up naturally. Disturbed patients make a great fuss at first in getting into the bath, splash the water about, pull the plug, and in general make that sort of disturbance which suggests their being

restrained. We have been using the continuous bath at the Government Hospital, however, for a number of years and we have never used restraint, and do not permit it under any circumstances; still we bathe all of the various classes of patients that are received in any hospital—the acutely disturbed, confused and delirious patients that require this sort of treatment. I am therefore convinced that restraint under these circumstances, aside from being dangerous, is unnecessary.

If, however, restraint is not resorted to it will require considerable patience and some tact to handle disturbed patients when the continuous bath is first used. In other words, if we would do away with a crude and useless device, which is nothing but a makeshift and an excuse for a lack of exertion, something has to be done, some patience, some intelligent effort has to be exercised, and of course this is the price that has to be paid if we are going to deal with the matter more efficiently.

When the patient is first taken to the continuous bath, and is very much disurbed, it is often necessary to have two or three nurses to help get him into the tub. Sometimes he will not stay there. Under these circumstances it is not well to insist too strenuously, as the patient does not always understand what is expected. Make the effort for perhaps 20 minutes and then drop the matter and try it again, either later on the same day, or perhaps not until the next day. As soon as the patient realizes that he is not going to be injured or drowned, or that something terrible is not going to happen to him, he will usually take to the bath kindly; and when he once experiences the soothing effect of the warm water he is generally pretty glad to remain in it. This may take three or four days of, so to speak, educational training, but it is worth while not only to avoid the sort of accident that prompted this article, but also it is better for the patient than it is to overpower him and tie him up in a situation which he does not understand, and which often terrifies him and therefore ruins the whole effect of the therapeutic measure.

Neither should so much stress be laid upon patients not getting out of the tub. A disturbed patient, if left to himself, will often get out of the tub and run about the room in a typical maniacal fashion, but he does not have to stay out of the tub but a very few moments when he becomes chilled and uncomfortable, and as a rule

is glad to get back into the water. If he is left alone, in the great majority of cases, he will go back of his own accord in a few minutes, and this should always be tried rather than an attempt made to force him back, thus starting a conflict between the patient and the nurse.

With women patients, especially in hospitals where there are male physicians in charge, and even otherwise, depending upon the case, it is well that they should be partly clothed, either in a light undershirt or chemise that comes down to the knees, or in a nightgown. This can be supplemented, if desirable, by taking an ordinary sheet and throwing it over the top of the tub so that the patients feel that they are not exposed, even though they be compelled by their excitement to get out of the tub.

I have also noted in this connection a practice, which I hope this article may help to counteract, among manufacturers who furnish continuous bath outfits for hospitals. The literature which they send out and which contains photographs, shows the use of restraint apparatus. Inasmuch as the continuous bath is being constantly installed in institutions which have had no previous experience or knowledge of it, I have no doubt that this method of advertising has had largely to do with its use. Manufacturers are undoubtedly anxious to provide what is wanted and what is best, and I am sure that if they can be made to understand the real danger of the use of restraint they will cease to advertise in this way.

In addition to the absolute rule that no patient is to be restrained, we have recently installed at the Government Hospital regulating valves in connection with the continuous baths which are permanently and unalterably set so that no water can be admitted to the bath at a temperature higher than that for which they are set. These valves we set for a temperature of 110° F. The principle upon which they operate is a simple one and it would seem that they are very safe. However, all mechanical contrivances are apt to go wrong at some time, and although they afford an added safety, still the nurse should never be permitted to leave the room, and should gain her knowledge of the temperature of the water from a bath thermometer and from frequently plunging her hand and arm into the bath. It is also highly desirable that the continuous bath-room should be so located that the nurse

would not be under any temptation at any time to leave it nor be subject to call.

Of all these precautions, however, the fundamental one and the most important is that the patient should not be restrained, because no person, no matter what their mental condition, unless they are seriously crippled, will scald to death in a bath tub provided they are free to get out. Even the most actively excited and confused will jump out of the bath tub if the water is hot. The reaction is too deeply biological to be seriously disturbed by mental clouding.

THE TREATMENT OF PARESIS AND TABES DORSALIS BY SALVARSANIZED SERUM.*

(CONCLUDED.)

By HENRY A. COTTON, A. M., M. D.,

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ABSTRACT OF CASES—GROUP 2.

CASE 4.—*A. H. (see Chart 12). Male, age 46. Married. Four children. A farmer. Tabetic-expansive type. Duration about four months. Twenty treatments Swift-Ellis, five treatments O. M. Result good, with some defect, unable to live at home. Some lack of judgment. Modified process, stationary case.*

Paresis in a married man, age 46, with negative family history and nothing unusual in personal history. Has four children, all healthy. Wife had several miscarriages. Up to date farmer, but somewhat odd.

Onset.—Sudden, about four months before admission. Marked change in habits and disposition, peculiar conduct and marked extravagances. Marked change of disposition. Admitted to the hospital November 5, 1913, and on admission mentally was somewhat euphoric, with impaired orientation. He exhibited marked absurd expansive ideas. Memory was defective for both recent and remote events. Personal identification, school knowledge and calculation were good. Absolutely no insight.

Physically.—Poorly nourished man, with typical paretic facies. Pupils do not react to light. Knee jerks absent. Markedly impaired motor functions, some incoordination. Characteristic speech defects, unsteady gait, swaying in Romberg position, and defective writing.

Progress of Case.—Gradual improvement after four treatments. The first two treatments were intraspinous and heterogeneous serum was used, *i. e.*, that from another patient who had been given intravenous injections. He did not show any marked improvement until the regular S.-E. treatment was given. The mental symptoms soon disappeared, lost his expansive delusions, memory became better, he became well oriented, but still retained a moderate degree of euphoria. He developed *good insight* into his condition. While in the hospital his wife was admitted, suffering from a maniacal attack of manic-depressive insanity. He showed but little interest in her condition and did not care to see her.

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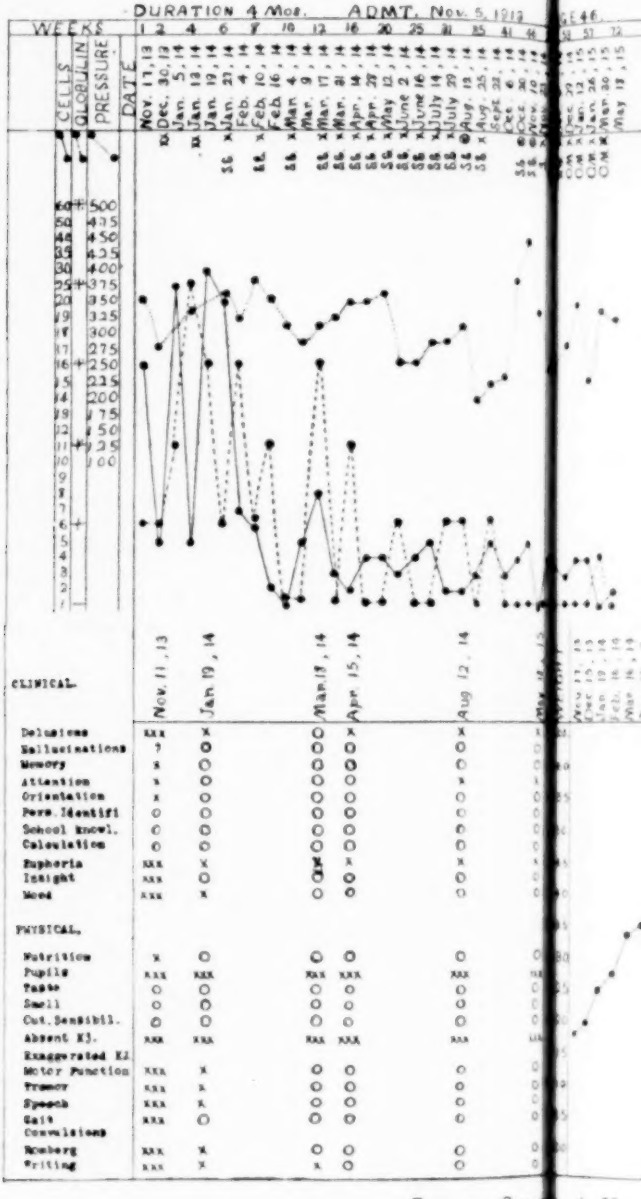
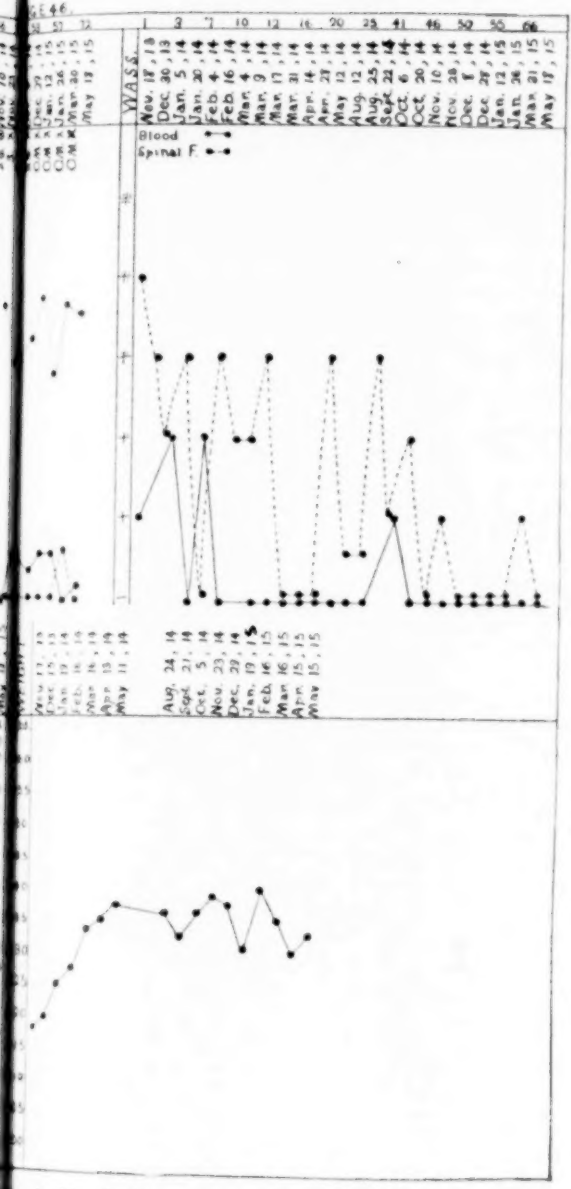
*Read in abstract at the seventieth annual meeting of the American Medico-Psychological Association, Baltimore, Md., May 26-29, 1914, and further enlarged.



CASE 4. CHART A. II.



A. H. G. P.

Physically, he improved greatly, weight increased from 115 to 137 pounds. He lost his paretic expression, took more interest in his surroundings, helped about the ward and dining-room. All physical signs disappeared except stiff pupils and absent knee jerks.

In April, 1914, he again developed absurd ideas, wanted to take about 800 of the patients to South Jersey to work in the glass works. Thought they could work well enough and become self-supporting. Unable to see the absurdity of his ideas. This showed marked lack of judgment, but he retained good insight into his mental condition. He continued to improve, and in September, 1914, gave up his absurd delusions laughed about them, showing good insight into the same. In November, 1914, he was allowed to go home for a visit with his wife in order to test the degree of recovery. He soon showed lack of judgment in managing his farm, wanted to be doing something all the time. Same extravagances noted—wanted to buy several teams and plough all the fields. He tried to run the farm as he had formerly, but was incapable of doing so. He was quite good-natured, except that he wanted to have his own way. He also developed sexual activity, which had disappeared before admission to the hospital, but was denied by wife. Became irritable at this refusal, and upon the advice of physician was returned to the hospital. He came back willingly and wanted to undergo further treatment.

The progress in this case is fair. He has not demented during this time, but has improved in every way. Still shows lack of judgment, and it is possible that he may always have this defect, although able to live outside. Treatment is continued.

Treatment and Biological Reaction.—This patient has had 16 Swift-Ellis treatments extending over ten months, and with exception of several doses, received full dose of neo-salvarsan intravenously. His first two treatments represented by XX under December 30, 1913—January 13, 1914, were intraspinous treatments with serum from another patient treated intravenously with neo-salvarsan. This exerted a very unfavorable effect upon the cell count and globulin content, as can be seen by the chart. The cell count jumped from 5 to 25, then dropped to 5 again. After a second similar treatment the cell count again jumped to 30 and did not fall to normal until after the next regular S.-E. treatment. The globulin also rose from + to + + +, then fell again after the second treatment. The Wassermann reactions were not particularly affected. This peculiar reaction was seen in all cases where a heterogeneous serum was given (notably case 14), and this method was promptly discontinued. Since then the cell count has reached normal, several times giving the dose regularly, but since March it has been well within normal. The globulin content has varied somewhat, but has been negative since September 22, 1914. The Wassermann reactions in the blood became negative after four treatments, falling from +, and on only one occasion going to ±. The spinal fluid Wassermann has varied greatly, dropping from + + + to negative, or varying from + + + to negative, but has shown a tendency to remain near the negative, at present.

After the experience on visit to his home he was given a treatment according to the Ogilvie method.

Discussion.—This is a comparatively early, but rapidly progressing case. Although the duration was but six months before treatment was begun, the disease had progressed much farther than the time indicated. He presented all the symptoms of a well-advanced paretic. Under treatment there has been marked improvement, both mentally and physically. It is one of the tabetic cases treated which have not shown complete remission. He is now a quiet, orderly patient, somewhat apathetic, but a good worker daily in the dining-room. He is well oriented and memory is good and he also has a fair insight. He can be regarded as a modified or stationary case.

CASE 5.—*E. R. (see Chart 13). Voluntary commitment. Male, age 46, married. Tabetic-expansive type. One year's duration. Apparently demented. Rapid improvement after four treatments. At home, in normal condition for six months, after eight treatments. Result good. Apparently an arrested case. Further treatment advised. Swift-Ellis treatment.*

Paresis in a married man, aged 46, with negative family history and uneventful personal history. Occupation, lithographer on newspaper. Onset sudden, one year prior to admission. Wife thought he was overworked. Took a trip to Chicago. Got off train at wrong station and was lost for three days. Amnesic period for this episode. Unable to go back to work. Became expansive and violent. Wife took him to live on farm with male attendant. Untidy in habits and apparently demented. Admitted as voluntary patient February 4, 1914. On admission talked in an incoherent, disconnected manner, with markedly expansive delusions. Disoriented for time and place. Demeanor indifferent, contented and unoccupied. Untidy in habits. Difficult to interrupt expansive stream of thought. Would not respond to questions. Disoriented for time, place and persons. Memory defective. Calculating ability markedly affected. Writing poor. Unlimited amount of wealth, billions and trillions, absurd expansive ideas, that he invented everything in the world, that he planted everything from gold dollars to rocking chairs, and has them growing, that the chairs came out of the ground perfect and painted brown. Marked euphoria. Mentally he was a typical expansive type of paresis.

Physically.—Defective nutrition. Weight 145 pounds. Pupils stiff to light and accommodation. Defective taste and smell. Absent knee jerks and Achilles reflex. Motor functions impaired. Marked tremors of hands and tongue and facial muscles. Speech slurring. Writing defective. Very unsteady gait, and swaying in Romberg position.

Progress of Case.—No especial change in patient until after four treatments, two weeks apart. From an apparently demented, untidy, helpless

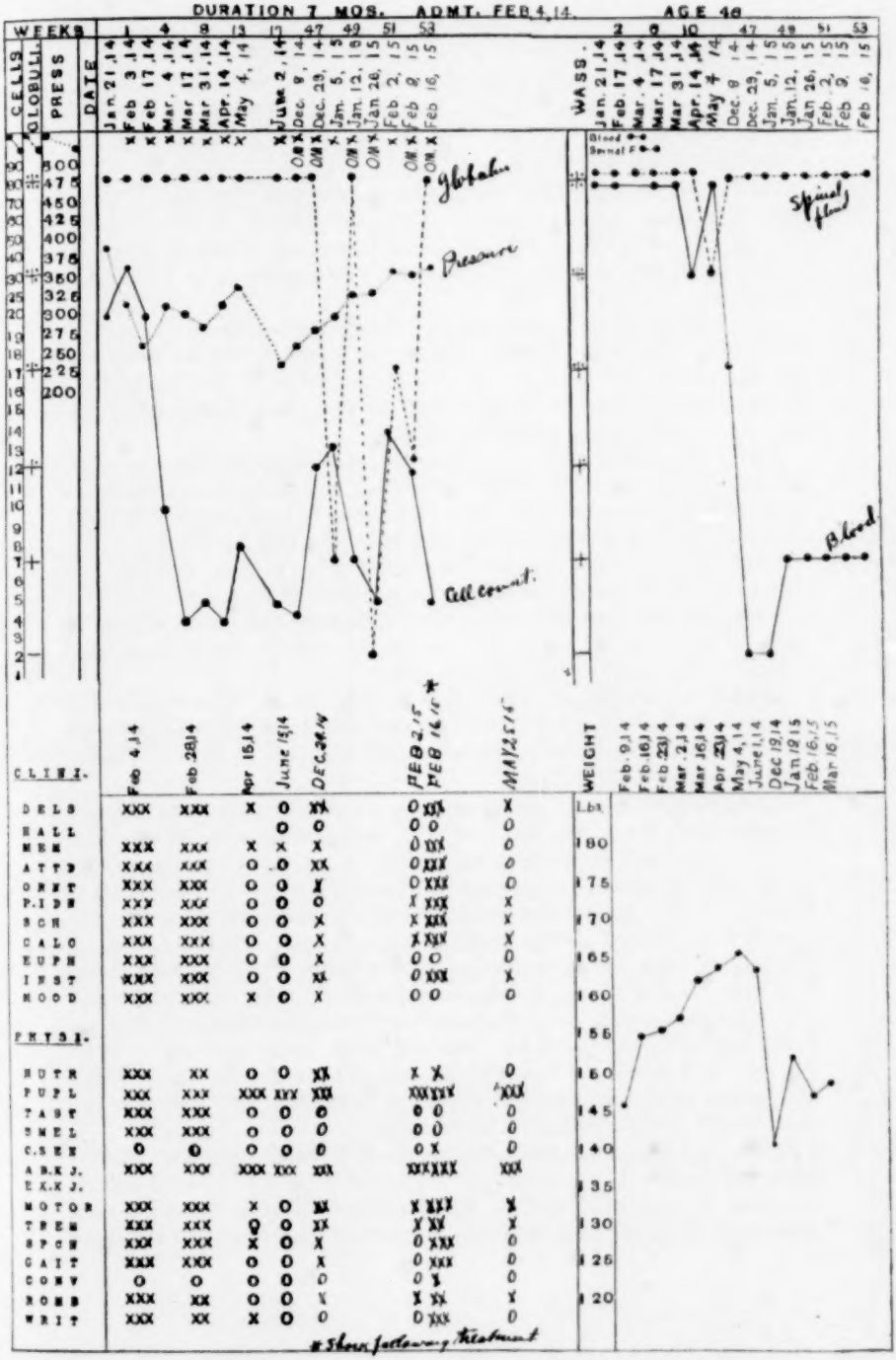
paretic, who had to have a special attendant, he gradually began to take some interest in his surroundings. He occupied himself with reading and talking to others. His expansive delusions gradually disappeared at first, only elicited upon questioning, when previously they were spontaneous and never-ending; gradually they disappeared entirely and he showed good insight. He became tidy in habits, dressed and undressed himself, and was able to leave the hospital April 16 with an attendant. He came back for three more treatments at monthly intervals; he had no treatment between June 2, 1914, and December 9, 1914. He was able to return home without an attendant, and lived at home since that date, apparently in a normal condition. His wife has been repeatedly warned to return him for observation and examination, but he was in such good condition that he refused to come.

This case showed the most startling transformation of any case in the series. From a helpless and apparently demented paretic he became a normal individual, able to care for himself and live at home, but has not taken up any active occupation, because it is not necessary. He had only eight treatments (the original Swift-Ellis), and should have had more. He gained 20 pounds in weight, improved physically, lost his speech and writing defects (see sample), gait became steady, tremors disappeared, and lost all appearance of a paretic so much in evidence on admission.

He remained at home in good condition for about five months, then gradually began to go down. He was returned to the hospital December, 1914, and he was in much the same condition as when first admitted. He had lost 25 pounds in weight, was stupid, had many expansive delusions and physical signs, such as speech defect, tremors, tabetic gait, were more pronounced. After his return to the hospital he was given six Ogilvie treatments with very good results, both clinically and biologically. He began to take more interest in his surroundings, and was apparently doing well when he had a convulsion, with aphasic disturbance, from which he nearly succumbed. However, he rallied and was later taken home by wife. The cell count after some fluctuation dropped to 5, and the globulin, which had been persistently 4+ for nearly a year, became negative, and then 4+ again. The blood Wassermann dropped from 4+ to negative, but the spinal fluid Wassermann persisted at 4+.

Like several of the tabo-paretics, this case showed remarkable improvement and was taken home by wife after eight treatments, because he was apparently recovered. He remained at home for six months, and for five months seemed well, then rapidly failed. He is similar to cases 31 and 30 and to some extent case 4, which were tabo-paretics which improved wonderfully after six or eight treatments and then went home and treatment was discontinued, after which there was a severe relapse, and in case 31 followed by death, and in case 30 by improvement and able to be at home.

Biological Reaction.—The cell count dropped gradually from 40 to 4 after the third treatment, rose to 8 after seventh, and again dropped to 5.



CASE 5. CHART 13. E. R. G. P. DISC. MAR. 11, 1915.

The globulin content has remained at 4+, as has also the blood and spinal fluid Wassermann.

This is the only case of this series where there has been a persistent 4+ globulin and 4+ Wassermann in blood and spinal fluid. Probably further treatment would have reduced the globulin and possibly the Wassermann reactions.

CASE 8.—*M. G. (see Chart 14). Female, age 35. Married. Irregular life. Expansive type. Duration one year. From Reformatory for Women. Ten Swift-Ellis and six Ogilvie treatments. Some improvement. Treatment interrupted for two months. Prognosis good. Excessive alcoholism.*

Paresis in a married woman, age 35. Family history shows considerable alcoholism and cancer. Farther dipsomaniac. Patient was wayward as a girl, but capable and efficient. At 17 went to New York and worked in a lawyer's office. Lived an irregular life for five years, then married and later divorced. Marked alcoholic excesses.

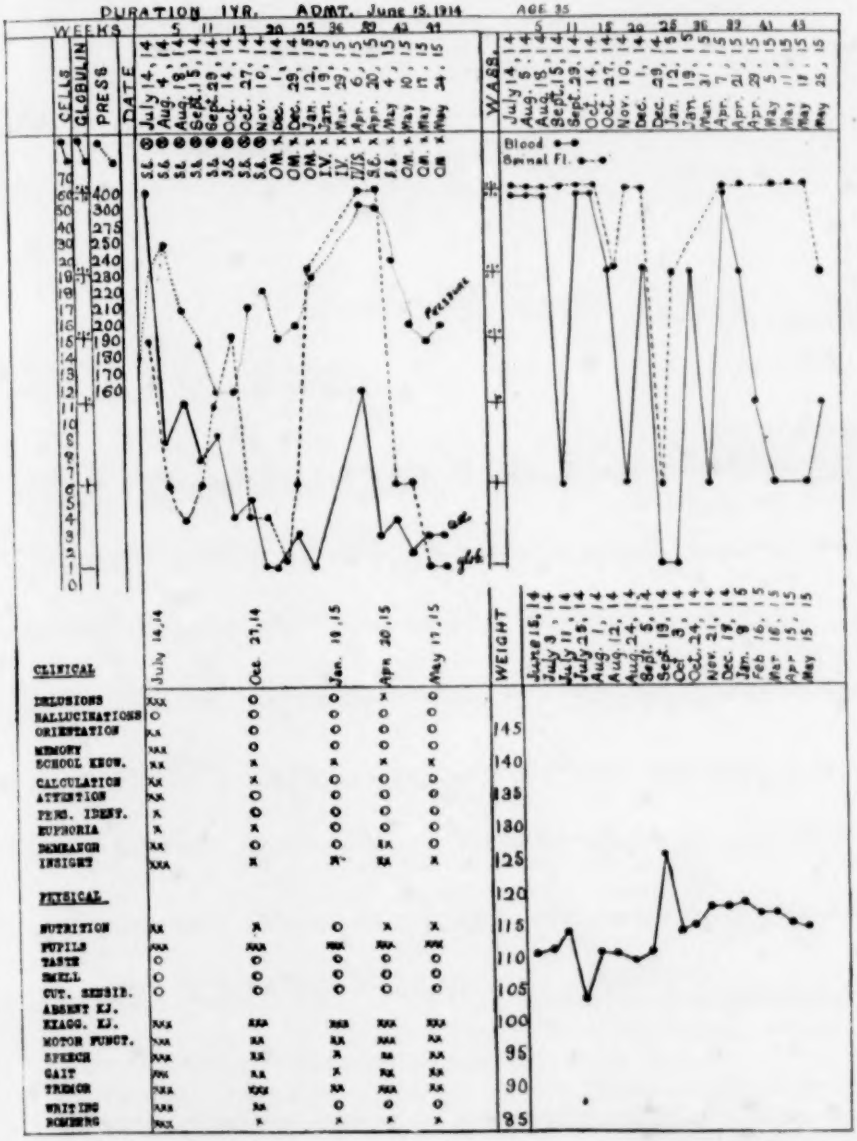
Onset.—Not known, but about one year ago began to show memory defects. Later she was arrested for stealing money, but was exonerated. Then sent to a house of detention and later to Reformatory for Women. There she became violent, irritable, and had to be kept locked up.

Admitted to the New Jersey State Hospital June 19, 1914, at which time she was somewhat confused, exhilarated and had expansive ideas. Orientation defective for time and place. Marked memory defects, especially for dates of events of her life and for recent events. School knowledge defective. No insight, and judgment poor.

Physically.—Poorly nourished, young looking woman. Knee jerks exaggerated. Marked tremors of facial muscles and hands. Speech defective and writing shows typical defects. Pupils sluggish to light. Marked incoordination. Gait unsteady.

Progress.—The patient was given eight Swift-Ellis treatments (.45 gm. neo-salvarsan) from July to November, with considerable improvement in both mental and physical condition. Then three O. M. treatments were given. She continued to improve and was given parole. In January, however, she left the hospital without permission and went to her mother's home. From there she wrote physician and asked to be allowed to remain. She was returned to the hospital in February after trying to elude nurses who had been sent for her, and was very resistive. After reaching hospital was somewhat excited and antagonistic and refused treatment. She had failed physically and mentally; was not in as good condition as when she left. It was difficult to get her to submit to treatment, but gradually she became more contented and at present is much better. She now has some insight and the prognosis seems better.

Reactions.—The cell count fell from 60 to 1 per cc. after eight Swift-Ellis treatments. The globulin also decreased from 3+ to negative, but increased to 3+ after two O. M. treatments. During the interval at home (and for some time following she refused treatment) the cell count



CASE 8. CHART 14. M. G. PARESIS.

rose to 12 per cc., but decreased to 3 after treatments were continued. The globulin also increased to 4+, and later became negative. The Wassermann reaction in the blood started at 4+, then gradually became negative (after some fluctuation). During the interval of interrupted

Saturday June 27th
(1914)

My Dear Mother:-

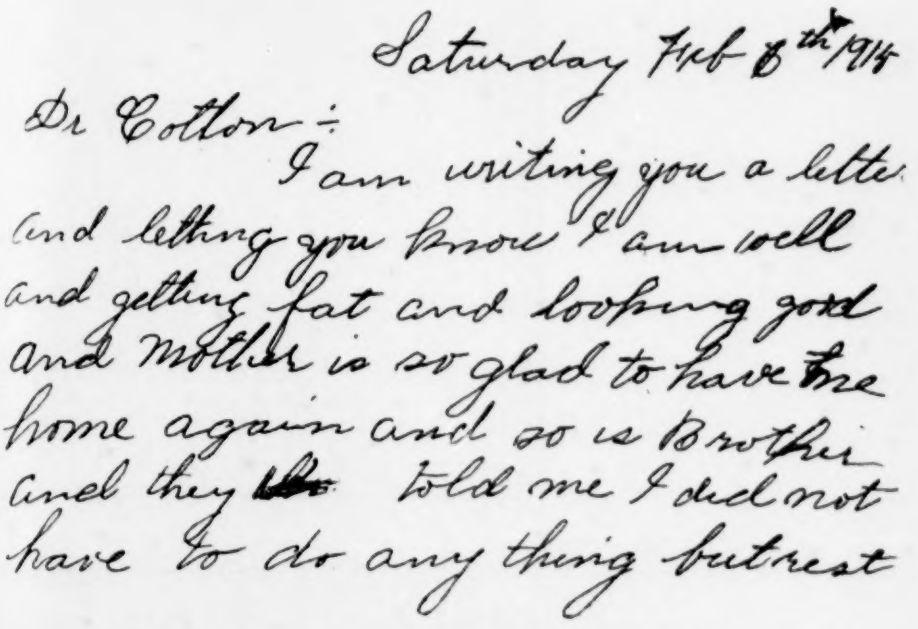
your dear letter
received and I am happy here
you are coming to see me may
be you can bring Marjory with
you I love see her with you
you can bring my things
withe you and bring me some
things to eat and candy
because they don't don't do any

CASE 8. FIG. 1. SPECIMEN OF WRITING ON ADMISSION.

treatment it again became 4+, but has gradually dropped to ±. In the spinal fluid the Wassermann was 4+, and after fluctuating became ±. During the interval it increased to 4+, and has remained so since treatment was resumed.

Colloidal Gold Reaction—5 5 4 4 3 3 2 1 0 0 0.

The patient is now getting weekly treatments with some success. The interruption, however, caused a relapse in her mental and physical condition, also in the reactions, but it was fortunately of short duration and the outlook seems better.



Saturday Feb 8th 1914

Dr Cotton:-

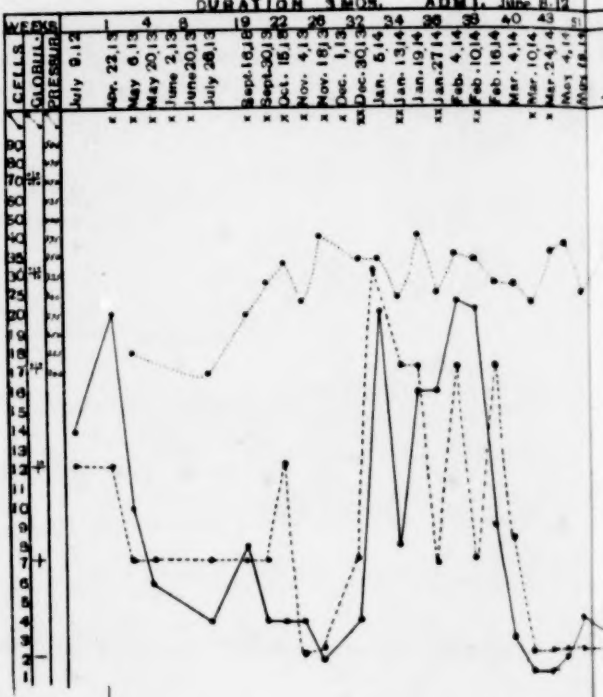
I am writing you a letter and letting you know I am well and getting fat and looking good and Mother is so glad to have me home again and so is Brother and they told me I did not have to do any thing but rest

CASE 8. FIG. 2. SPECIMENS OF WRITING EIGHT MONTHS AFTER TREATMENT.

CASE 14.—*A. B. (see Chart 15). Juvenile paretic, age 23. Onset 1½ years prior to treatment. Changed from a dull, stupid, untidy patient to bright, alert and improved physical condition. Modified progress of disease. Mild deterioration. Swift-Ellis treatment. Stationary case at present.*

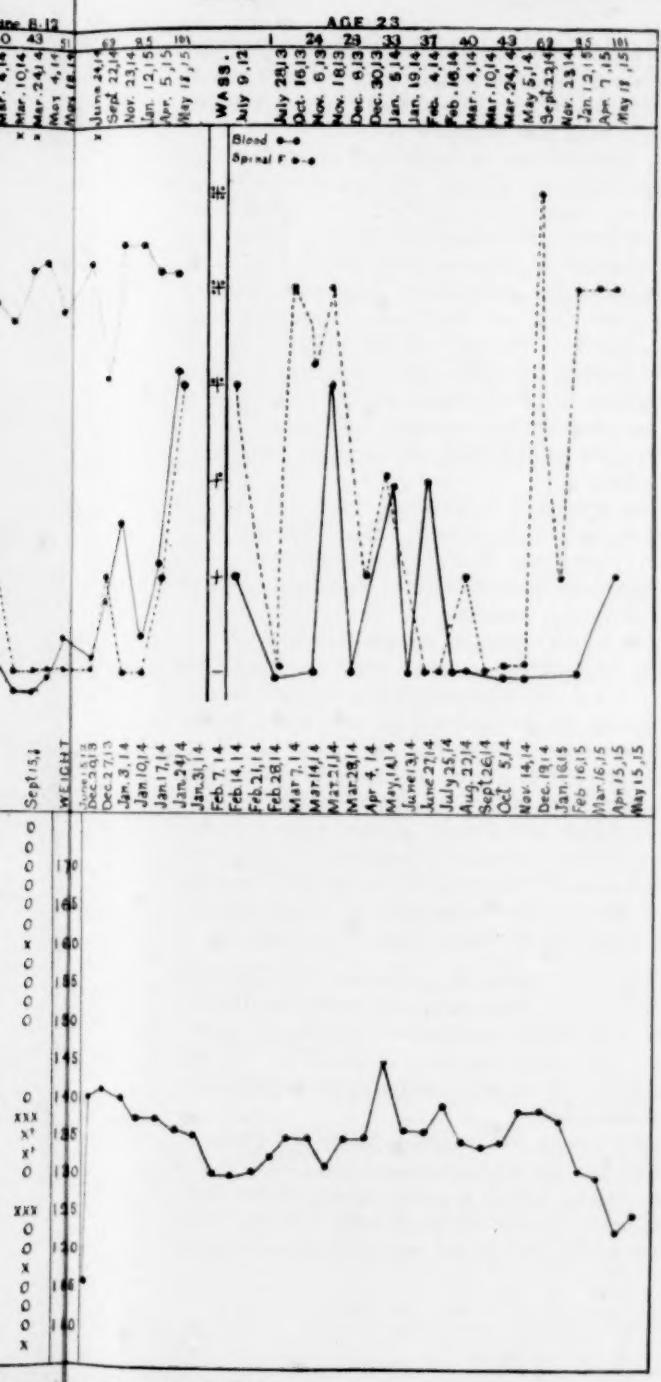
A case of juvenile paresis in a boy age 23. Nothing known of family or personal history. Common school education, and for five years worked as a messenger for the Associated Press Office in Philadelphia. Stopped work two months before admission, June 28, 1912.

Physical Examination.—On admission thin, poorly nourished boy. Weight 117 pounds. Had had frequent fainting attacks, fell around on the streets and broke collar bone just before admission. Pupils unequal, stiff to light. Marked speech defect. Spastic gait. Tremors of hands, tongue and facial muscles. Knee jerks exaggerated and marked ankle clonus. Writing defects.



CLINICAL	July 10,12	Oct 12,12	Aug 13,13	Jan 14,14	Mar 14,14	June 15,14	Sept 15,14	WEIGHT
DELUSIONS	0	0	0	0	0	0	0	
HALLUCINA.	0	0	0	0	0	0	0	
MEMORY	XXX	XXX	0	0	0	0	0	
ATTENTION	XX	XX	0	X	0	0	0	
ORIENTATION	X	XX	0	0	0	0	0	
PERS. IDENT.	X	X	0	0	0	0	0	
SCHOOL KNOW.	XX	XX	X	X	X	X	X	
CALCULATION	XXX	XX	0	0	0	0	0	
SUPERCRIA	0	0	0	0	0	0	0	
INSIGHT	XX	XX	0	0	0	0	0	
MOOD	0	0	0	0	0	0	0	
PHYSICAL								
NUTRITION	XX	0	0	X	0	0	0	
PUPILS	XXX	XXX	XXX	XXX	XXX	XXX	XXX	
TASTE	X	X	X	X	X?	X?	X?	
SMELL	X	X	X	X	X?	X?	X?	
CUT. SENSIB.	0	0	0	0	0	0	0	
ABSENT KJ.								
EXAG. KJ.	XXX	XXX	XXX	XXX	XXX	XXX	XXX	
MOTOR PARCY.	XXX	XX	X	XX	X	0	0	
TREMOR	X	X	X	XX	X	0	0	
SPEECH	XXX	XXX	X	XX	X	X	X	
GAIT	XXX	XXX	X	X	0	0	0	
CONVULSIONS	XX	0	0	0	0	0	0	
BONNERS	XX	XX	X	X	0	0	0	
WRITING	XX	XX	X	X	X	X	X	

CASE 14. CHART 15. A



15. Allen Bk. Juvenile G. P.

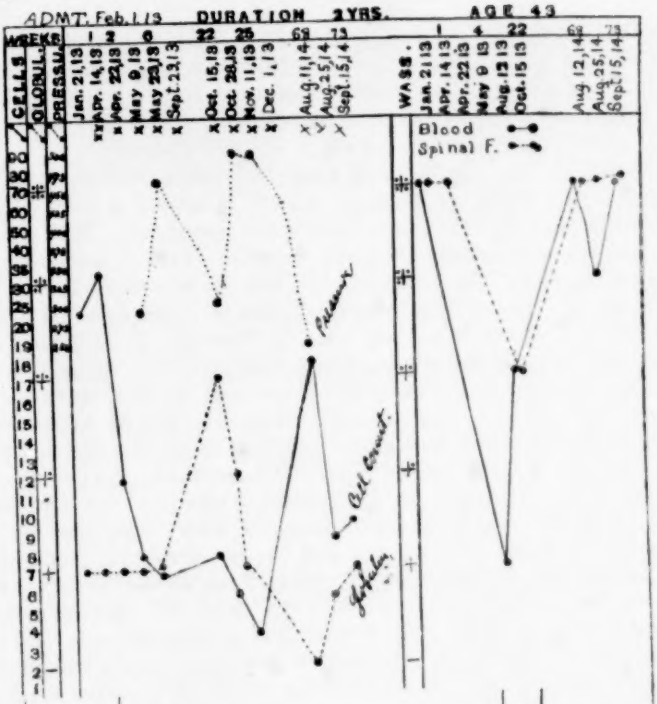
Mental Examination.—Mentally the patient was dull, stupid and untidy. Sits about the ward unoccupied and indolent. Orientation defective for time. Memory shows very typical defects. School knowledge and calculation ability poor. Insight and judgment defective.

Progress of Case.—At first, from the age of patient and general apathy, the case was considered one of dementia præcox, until the physical signs were noted and lumbar puncture found to be positive. He remained in this condition for eight months, when treatment was started. After six treatments he began to show considerable improvement. He lost his dull, stupid expression and demeanor, became more alert. Took more interest in his surroundings, read a great deal, and there was a corresponding improvement in his physical condition. His gait became steadier, loss of ataxia, speech clearer and not slurring, but some tremor remained. Gained 23 pounds in weight. He received in all 18 treatments, the last being a year ago (June, 1914), and his condition has remained stationary. He is mildly deteriorated, but works daily on the ward and is bright and alert, showing good memory and insight.

Treatment.—He was given the original S.-E. treatment every two weeks, with the result that the cell count fell from 20 to 2, and the globulin became negative. The blood and spinal fluid Wassermann fluctuated some, but were reduced to negative. However, three months after last treatment the spinal fluid Wassermann became 4+. Between December 13 and February 14 he was given a heterogeneous serum—that is, a salvarsanized serum obtained from another patient—and the result was a marked increase of the cells (from 4 to 20) and a corresponding increase in the globulin content. After this serum was discontinued the cells and globulin became normal again. This phenomenon was noticed also in case 4, where a similar increase in this number of cells per cc. and globulin was noted when a heterogeneous serum was injected into the spinal canal. We can consider this case as one in which the disease process was partially arrested and the course of the disease considerably modified. Since treatment was discontinued the spinal fluid Wassermann has become strongly positive, and after a year is minus. The probabilities are that he will remain in his present condition and can be termed a stationary case.

CASE 30.—*J. W. G. (see Chart 16). Voluntary commitment. Male, age 43. Tabetic type. Duration two years. Progressive deterioration. Rapid improvement following four Swift-Ellis treatments. Treatment interrupted twice, with relapses. Temporary paralysis of bladder. Severe reaction to treatment. Recovery from mental symptoms, but progression of physical symptoms. Prognosis poor.*

Tabo-paresis in a married man, age 43, with negative family and personal history. Onset of both mental and physical symptoms about two years before admission. Began by having lightning pains, speech defect and loss of memory, but was able to continue at work. Admitted to the New Jersey State Hospital February 1, 1913, in a dazed, stupid condition, unable to talk or answer questions.



CLINICAL	Feb. 8, 13	Apr. 22, 13	Oct. 15, 13	Aug. 11, 14	Jan. 1, 15	May 10, 15
DELUSIONS	XX	O	O	X	O	O
HALLUCINA.	O	O	O	O	O	O
ORIENTATION	O	O	O	O	X	X
MEMORY	X	O	O	O	X	X
SCHOOL KNOW.	XX		X	X	X	X
CALCULATION	XX	O	O	O	O	O
ATTENTION	XXX	O	O	XX	XX	XX
PERS. IDENT.	O	O	O	O	O	O
EUPHORIA	O	O	O	O	X	X
DEMEANOR	O	O	O	O	XX	XX
INSIGHT	X	O	O	X	X	X
PHYSICAL						
NUTRITION	O	O	O	O	O	O
PUPILS	XXX	XXX	XXX	XXX	XXX	XXX
TASTE	O	O	O	O	O	O
SMELL	O	O	O	O	O	O
CUT. SENSIB.	XX	XX	XX	XX	XX	XX
ABSENT KJ.	XXX	XXX	XXX	XXX	XXX	XXX
EXAG. KJ.						
MOTOR FUNCT.	XXX	X	X	XX	XX	XX
SPEECH	XXX	X	X	XX	XX	XX
GAIT	XXX	X	X	XX	XX	XX
TREMOR	XX	X	X	XX	XX	XX
WRITING	XX	X	X	X	X	X
ROMBERG.	XXX	XXX	XX	XX	XX	XX

WEIGHT	Aug 10, 14	Aug 17, 14	Aug 31, 14	Sept 14, 14	Sept 21, 14
Lbs.					
190					
185					
180					
175					
170					
165					
160					
155					
150					
145					
140					
135					
130					

CASE 30. CHART 16. J. W. G. G. P. DIS. APR. 22, 1913.

Physically.—He was a well-nourished white man. Headache in frontal region. Regular, unequal pupils, sluggish to light. Absent knee jerks and Achilles. Diminished pain sense in lower extremities. No convulsions. Motor functions defective, with slurring speech, ataxic gait and speech defect. Tremors of hands and tongue. Writing defective.

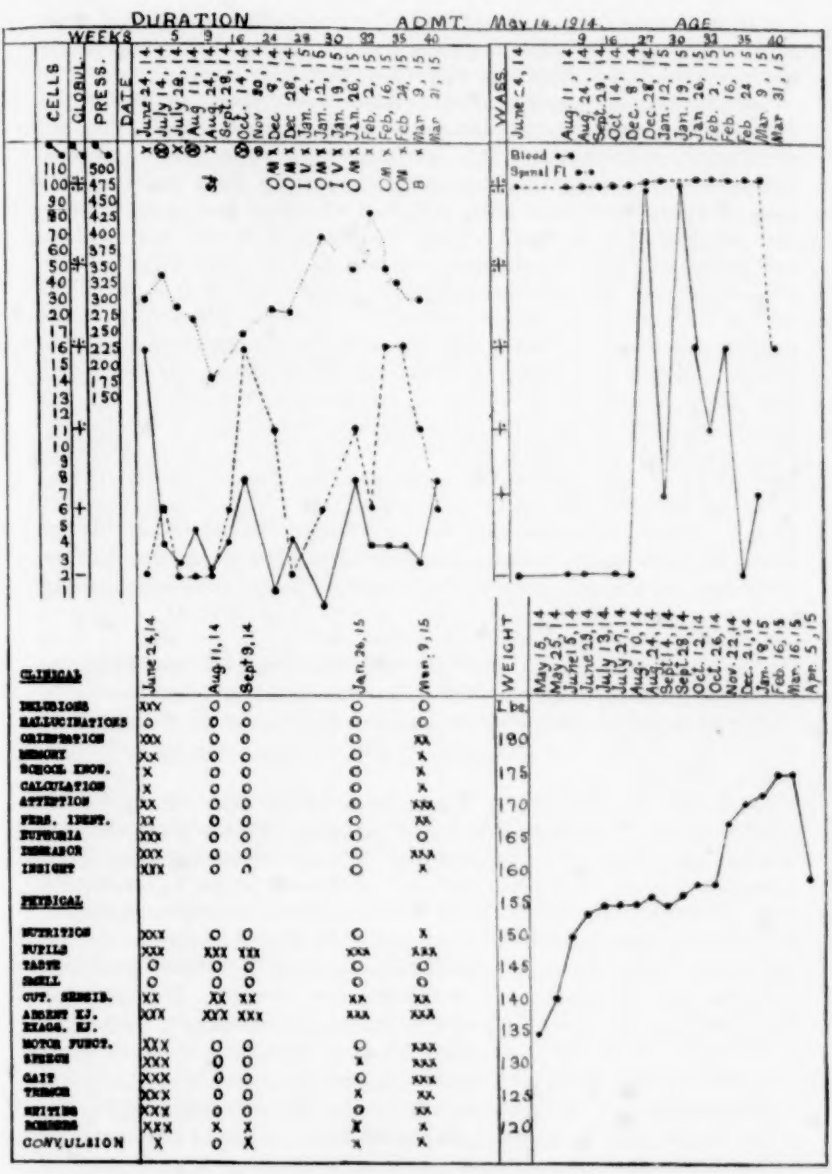
Mentally.—He was quiet, but stupid and slept most of the time. Difficult to arouse him. Hesitating in speech, answers questions in monosyllables. He exhibited some delusions of poisoning and persecution. Well oriented for time, place and person. Memory defective. School knowledge and calculation defective. Very little insight into his condition.

Progress of Case.—Patient rapidly improved after four Swift-Ellis treatments, and wife removed him from the hospital against advice. He became much brighter, talkative, and improved physically, although he had some speech defect. He remained at home four months, when he was returned to the hospital. He had rather severe reaction to the treatment, and after fourth injection had severe paralysis of bladder and had to be catheterized for a week or ten days. This gradually cleared up. He remained in the hospital for four months, receiving five treatments (S.-E.), when he was again taken home by wife. This time he had improved very much and he was able to go about his work, drive about the city, but he was returned upon advice of the physician. He had three more treatments, and after the third one became partially paralyzed, unable to walk, with bladder and rectum paralysis, and was in rather a critical condition. He began to deteriorate slowly and physical symptoms became worse. He always had a severe reaction after the intravenous injections, and is the only one in a series of 66 cases that showed any bladder symptoms after intraspinous injections. On two occasions definite bladder and rectal paralysis followed the treatment (Swift-Ellis), but he recovered from both attacks.

He was again removed from the hospital by his wife in October, 1914, and has since remained at home, but with no improvement, and is gradually failing, both mentally and physically. The case belongs to the group of tabetic cases or tabo-paresis, and, like those cases, showed marked improvement at first, but because of this improvement they were, like this patient, removed from the hospital and treatment interrupted, and then a relapse occurred, from which the patient did not rally in spite of continued treatments.

CASE 31.—*H. L. (see Chart 17). Male, age 40. Tabetic-expansive type. Tabes of 11 years' duration (?). Paresis of two years' duration, gradual inefficiency. Convulsions, progressing dementia. Expansive ideas. Five intravenous injections of salvarsan without effect. Rapid improvement under Swift-Ellis treatment. Marked remission. Died during treatment after one year.*

Paresis in a married man, age 40, with negative family history and negative personal history. Salesman, making $100 per week. Married for 12 years, has had three children, all healthy. Eleven years ago had an



CASE 31. CHART 17. H. LAC. TABETIC G. P. DIED APR. 11, 1915.

attack of "ptomaine poisoning" (?) (beginning crises (?)), and these continued every three months for six years. These attacks described by brother, a physician. Unable to retain anything on stomach. No elevation of temperature and no pain. Often these attacks lasted six weeks, fed with nutrient enemas. For five years these seizures ceased. For last three years complained at times of excruciating pains, which occurred mostly at night and were of momentary duration. Pain in fingers and toes. For last year has not been able to work. Once had to be catheterized for retention of urine. There was gradual mental deterioration, inefficiency, and lack of judgment. On May 22, 1913, he had several convulsive seizures. He was admitted to the neurological ward of the Kings County Hospital, where he was violent and unmanageable and had to be forcibly restrained. Showed defective memory and orientation, speech defective, absent knee jerks and pupillary disturbances. He was given there three intravenous injections of salvarsan without effect. He was transferred to the Long Island State Hospital, June 4, 1913. On admission there, was quiet, disoriented; thought he was in his own home; had been there 11 years, and at another time for six days. Marked memory defect. Stated he had been married 11 years, was married in 1911-1912, unable to give any account of commitment to that hospital. Retention *nil*. School knowledge and general information poor. No delusions of grandeur on admission, but euphoric and elated. General feeling of well-being. Absolutely no insight. On the 12th of June was given intravenous injection of neo-salvarsan, 9/10 gm. Vomited several times. On the 26th of June patient expressed expansive ideas, power to heal sick, had communication with Christ, that he is going to cure all diseases, going to buy an airship, has boarders and charges $1.25 a meal, that he is going to make millions and travel around the world. On the 26th of June given another intravenous injection.

Physically.—Unequal pupils, absent knee jerks, characteristic speech defects, tremors of hands and tongue, anæmia. Lumbar puncture gave positive reaction for general paralysis. Positive blood and fluid Wassermann. He improved some and was discharged to wife, October 18, 1913. At home he did well for some months, but had a series of convulsions and was unable to work.

He was admitted to this hospital May 14, 1914, in a dazed condition, demented, general feeling of well-being, but irritable. Memory was defective, especially for recent events. School knowledge and calculating ability fair. No marked expansive delusions, but a tendency to same. Thought he was able to go to work. Absolutely no insight.

Physically he was in a poor condition. Weight only 135 pounds. He had a bad abrasion on nose, result of fall (convulsion?), also abrasions about elbows, hands, knees and shins. Right foot swollen. Bruises on chest, chin and lower legs. Smell normal. *Eyes*—Pupils equal, but no reaction to light, slight to accommodation. Cutaneous sensibilities dull over lower extremities to heat and cold and pain, otherwise negative.

Knee jerks and Achilles absent. *Motor functions*—Swaying in Romberg. Marked tremors of tongue. Speech defect, characteristic. Writing defective. No digestive disturbance. Although the committing physician stated that he had expansive ideas, these were not brought out after admission. He walked away from home and could not tell where he was.

Progress of Case.—Soon after taking the Swift-Ellis treatment here he improved very much, and for last three months has had parole. He spent his time in reading, going to town, and acts in a perfectly normal manner. His memory is good, well oriented, no delusions, and has perfect insight. He has improved physically, gained 40 pounds in weight. Gait normal. No appreciable speech defect. Writing good, but knee jerks and pupils remain unchanged.

Patient continued to improve, but had an occasional convulsion and seemed to be slowly deteriorating. The spinal fluid Wassermann remained 4+ and apparently could not be influenced. His treatment was changed to Byrnes bichloride method, but soon after injection he had several convulsions and finally went into a collapsed condition, from which he rallied, but finally succumbed to a septic infection of the arm a month later, and died April 18, 1915.

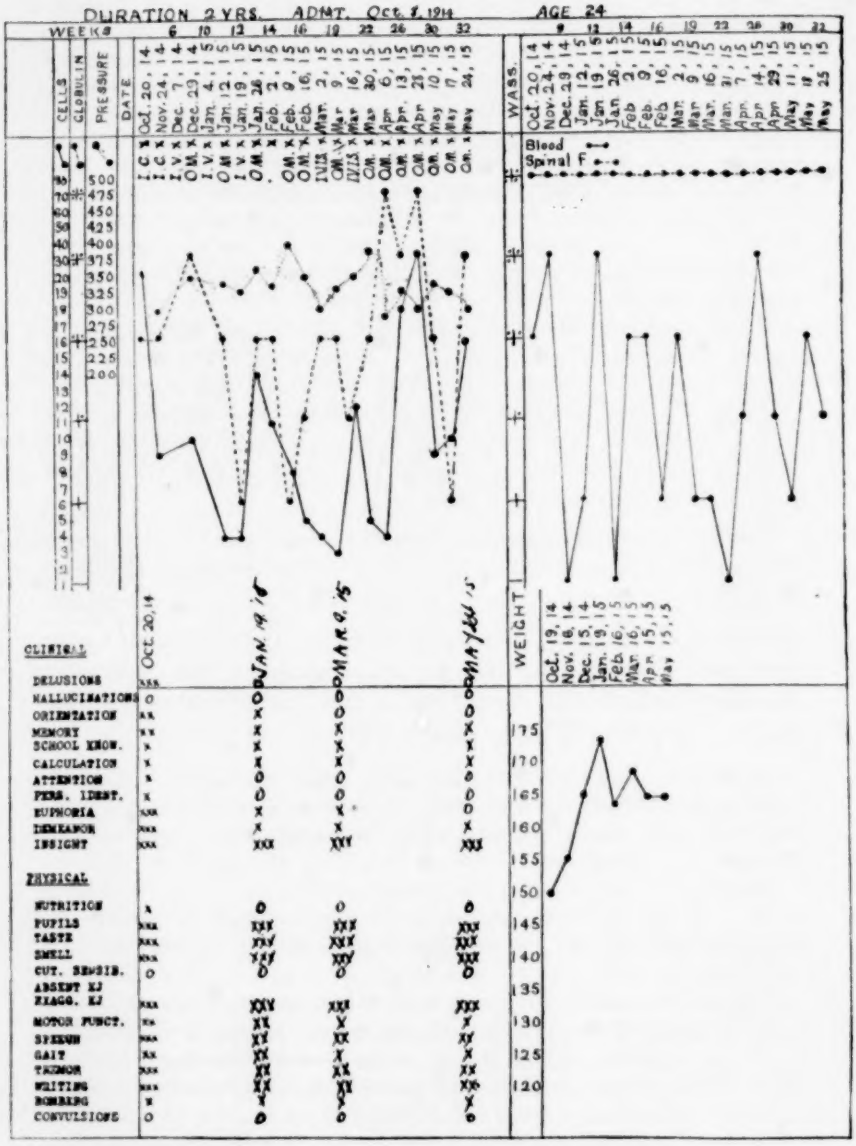
Discussion.—This is another case of tabo-paresis which showed marked improvement to treatment, but which showed a tendency to remissions. He had a series of treatments a year before admission here, but for six months received no treatment. He was apparently doing well when he had a collapse, not following treatment but several days after a bichloride treatment. His case is somewhat similar to cases 5 and 30.

CASE 35.—*C. P. (see Chart 18). Male, age 34, married. Bayman. Duration before treatment two years. Expansive type. Two intracranial, five Swift-Ellis, 12 Ogilvie methods. Some improvement. Still under treatment. Prognosis fair.*

Paresis in a married man, age 34, with negative family and personal history. Common school education, but rather low grade of intelligence, and by occupation a bayman or oysterman on the sailing boats at Barnegat Bay.

Onset of Psychosis.—About two years before admission to New Jersey State Hospital, October 8, 1914. Gradual loss of memory and inefficient. Developed expansive delusions and showed marked conduct disorders, going into neighbors' houses and appropriating articles belonging to them. Arrested and later committed here, October 8, 1914.

Physical Examination.—On admission showed marked tremor of tongue, unequal, stiff pupils, swaying in Romberg, exaggerated knee jerks, marked speech defect, and writing defective. Smell and taste defective. Cutaneous sensibilities hypersensitive and no dulling.



CASE 35. CHART 18. C. PAR. G. P. EXPANSIVE TYPE. SOME IMPROVEMENT.

Mental Examination.—General feeling of well-being and euphoria, but with marked memory defect and defect in orientation. Unable to remember name of place a few minutes after having been told. Expansive ideas regarding property and his business affairs. Data of personal identification defective. School knowledge and calculation ability poor. Absolutely no insight into his condition.

Progress of Case.—Patient has shown but little improvement in his mental condition. He is better oriented and his memory has improved. He has lost his expansive delusions, but has not as yet developed any insight. He shows variable moods, at times good natured and smiling, at other times depressed and crying. Very anxious to go home. He has improved somewhat physically, has gained 25 pounds in weight, but the neurological symptoms are about the same. He still has a marked speech defect and tremors.

Treatment and Reactions.—This patient had two intracranial punctures (Wardner) at the beginning of his treatment, but this method had to be discontinued because of certain circumstances which could not be removed at that time, and following this treatment he was given five Swift-Ellis and 12 Ogilvie treatments. For the last two months he has had weekly treatments with some improvement. He has shown no untoward reactions following either the intracranial or intraspinal treatments.

Colloidal Gold Reaction.—5 5 5 4 4 3 1 1 1 0 0.

Reactions.—The cell count fell rapidly from 30 to 4 per cc. after three treatments, but has shown a tendency to fluctuate at times as high as 30 and frequently becoming normal. The globulin content has followed the fluctuations of the cell count to some extent. Beginning at 2+ it became 3+, then reached —, but when the cell count increased to 30 the globulin also became 4 +. The blood Wassermann has shown the usual fluctuation, at times as strong as 3+ and frequently negative. The Wassermann reaction in the spinal fluid, however, has remained persistently 4+, and has not been influenced by treatment.

Prognosis.—The long duration (two years) renders the prognosis doubtful, especially as the patient has shown but little improvement after 17 treatments. However, there has been some improvement, and he will be treated further, as he has shown no tendency to become more demented.

Group 3. Unimproved. (7 Cases, 22.5%.)

In this group we have reported seven cases, which have been treated for sufficient period for us to conclude that further treatments would be useless. Two patients (15 and 16) were of the juvenile type, both in the advanced stages of paresis. In the former the duration was put at three years and in the latter 18 months. The effect of the treatment upon the mental condition in both was nil. In one (case 15) the globulin was negative and

remained so, and in case 16 the globulin was very positive, and after reaching 2 + it became negative and has remained so.

The cell count was reduced from 30 to 1 and 70 to 1, respectively, in both cases. The Wassermann reactions were entirely dissimilar; in case 15 the blood was strongly positive and in case 16 barely positive. Both reactions became negative and have remained so. They received a combination of the S.-E. and O. M. treatments, but neither was successful.

All of these cases were of the demented type and in two cases, 34 and 17, they were also markedly expansive. But the predominating feature of this group is dementia of a rapid type. The duration varied from one to three years, the average duration being one year and three months, somewhat below the general average duration for paresis. All of these cases were admitted during the last year and a half, so were given treatments, although little was expected from the fact that they were much demented when admitted.

One case (34) deserves special mention, as the patient was persistently resistive and with one or two exceptions it was necessary to anæsthetize him three times for every treatment (intravenous injection, withdrawing blood, and intraspinous injection). The treatment has had some effect upon his mental condition, as he became quieter and has been able to assist on the wards, but aside from this he has continued in the same demented condition as on admission. This patient has received 16 S.-E. treatments and two intracranial, one the regular and the second the Cotton modification, but there was no improvement from any method. The cell count has become normal (from 100 to 3 cc.) and the globulin has also been reduced from 4 + to negative. The blood Wassermann was weakly positive and soon became negative, while the spinal fluid reaction has varied from negative to 4 + to negative.

In three of these cases the spinal fluid Wassermann was not strongly positive, but the blood Wassermann was 4 + in five cases and in all but one it was reduced to negative. Case 17 has had three intracranial treatments after four O. M. and five S.-E. treatments with no success.

The globulin reaction in five cases was 4 + and was reduced by the treatment to negative, except in one case (17), after

becoming negative and after a year's interval without treatment, the cell count increased to 50 and the globulin was strongly positive. Most of the cases in this group showed increase in weight, from 20 to 45 pounds; especially in case 34 was the increase noted. All the cases are in good physical condition at the present time, but are profoundly demented mentally.

CASES OF GROUP 3.

CASE 15.—*A. C. Paresis, male, age 23. Juvenile demented type. Congenital deformity of hands and feet. Duration three years. Five S.-E. and four O. M. treatments. No change. Moderately demented. Prognosis bad. (See chart 19.)*

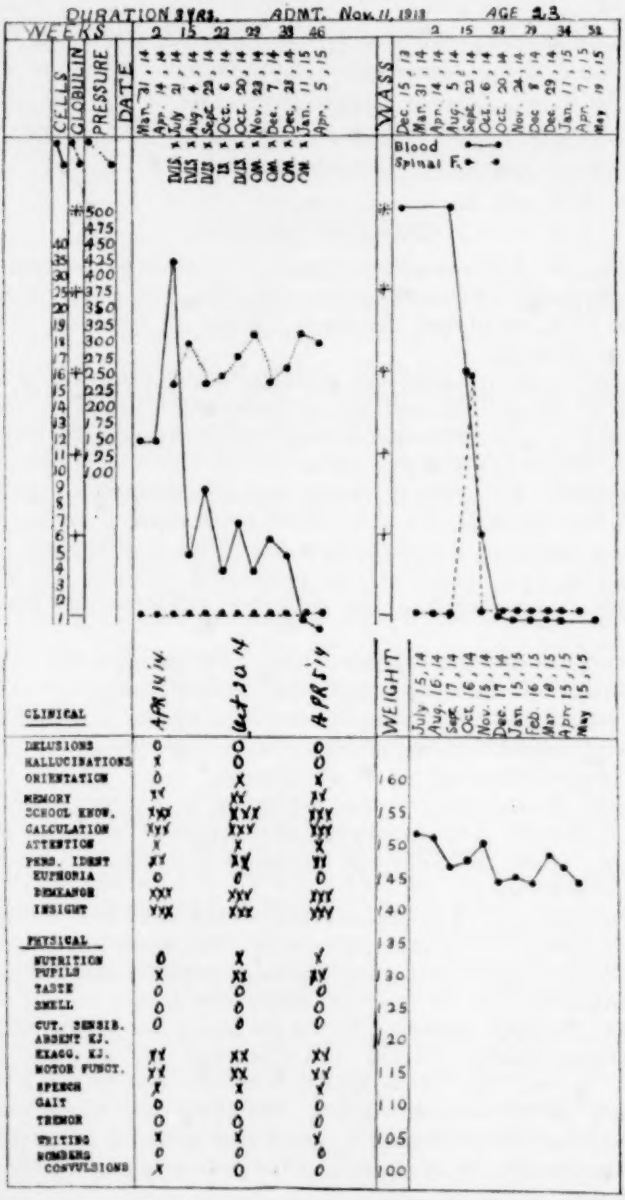
Juvenile paresis in a somewhat physically defective boy with congenital deformities of both hands and feet (defective fingers and toes). Received a fair common school education until age 16. Worked at trade of plumber, showing talent and industry in work.

Onset of Psychosis.—About three years ago had a shock involving right side of face and right arm, from which he recovered after four weeks. Since then decreased interest in work and change in disposition. A year ago gave up work, dissatisfied with people with whom he had to work. Gradually became seclusive and demented. Admitted here November 11, 1913.

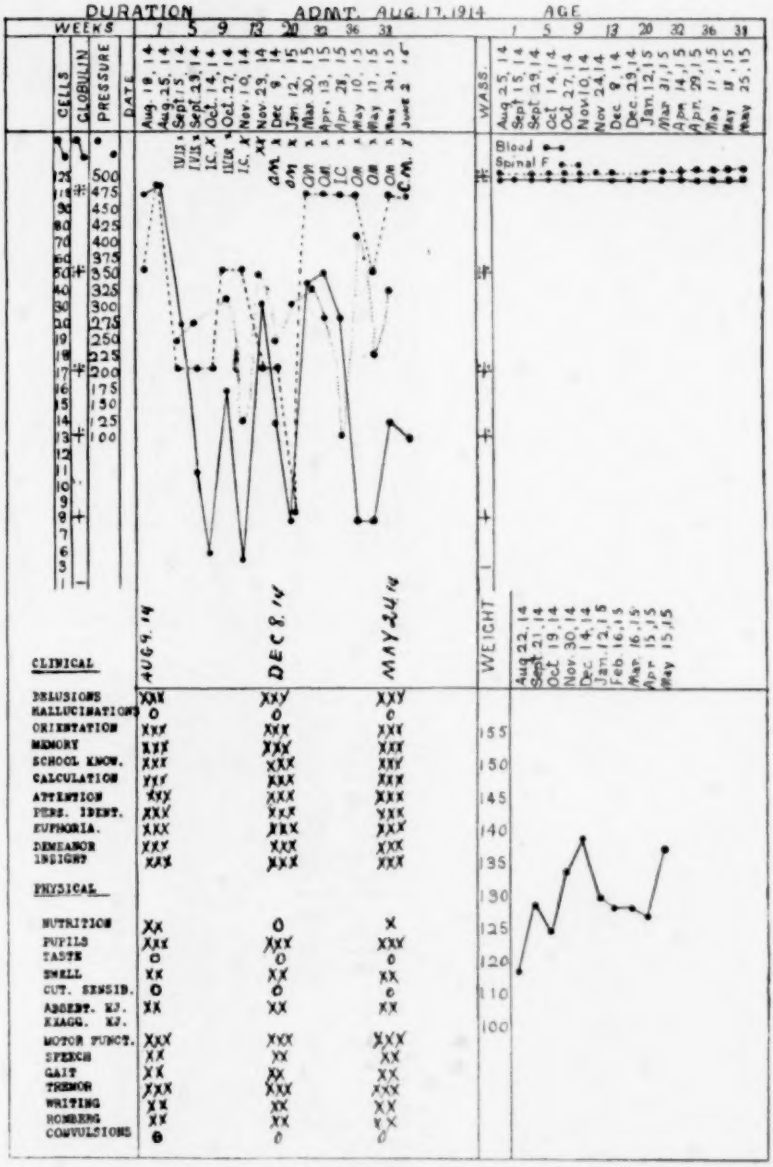
Physically he was well nourished. Congenital deformities of hands and feet, absence of some fingers and toes. General feeling of well-being. Pupils dilated and equal. Normal reaction to light. No disturbance of taste, smell or cutaneous sensibilities. Knee jerks normal. No tremors, but writing defective, and speech slurring.

Mentally he was apathetic and indifferent to his surroundings. No delusions elicited. Well oriented for place and person and time. Memory defective. School knowledge and calculation defective. No insight, and judgment defective.

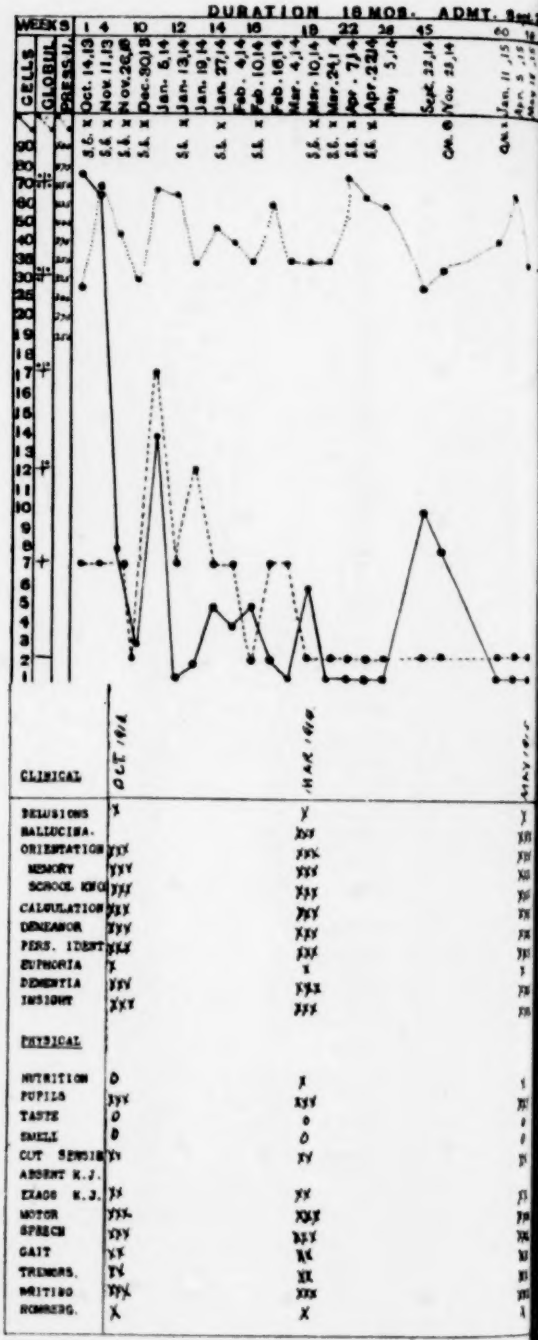
Progress.—Patient has shown no improvement after five S.-E. and five O. M. treatments. He is rapidly dementing. His physical signs are rather slight, but progressing gradually. He has lost weight, about five pounds since admission. The cell count has fallen from 35 to 1, and the globulin has been persistently negative. This is the second case of our series with a persistent negative globulin. The other case (1) was also one of juvenile paresis. The blood Wassermann was 4+ before treatment, and has gradually fallen to negative. The spinal fluid Wassermann was negative on admission, became 2+ and then negative. The treatments were discontinued, as no apparent effect was produced in his mental condition.



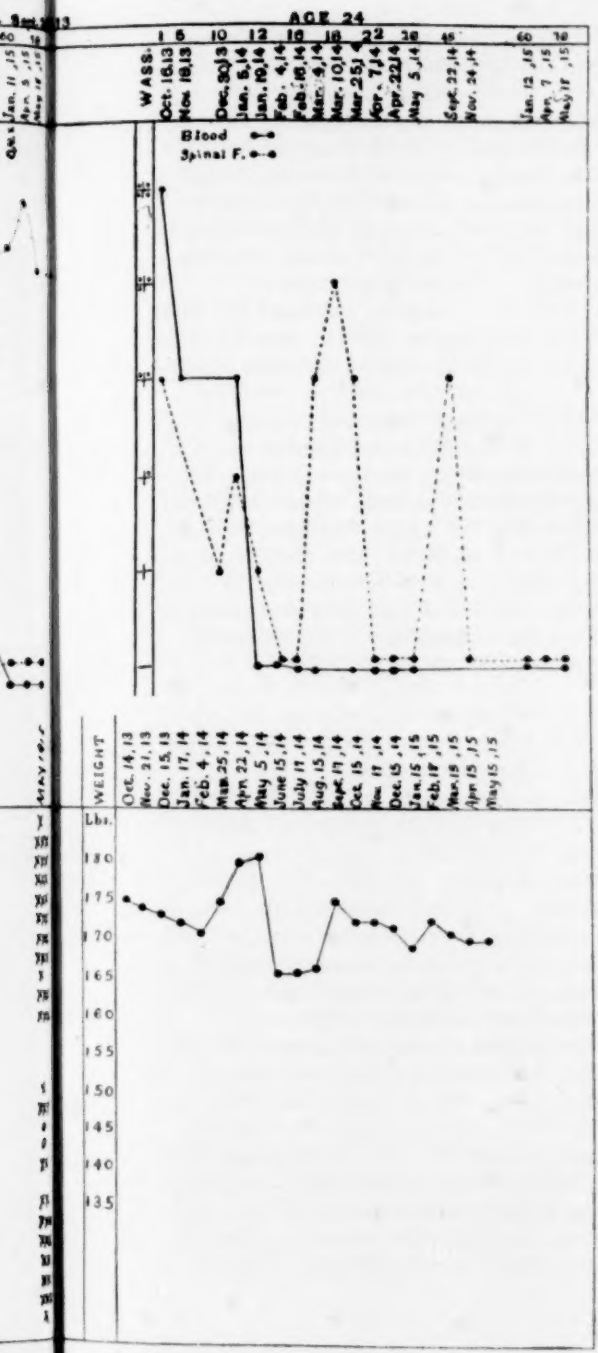
CASE 15. CHART 19. ARTHUR CH. JUVENILE PARESIS.



CASE 17. CHART 20. JOS. STR.



CASE 16. CHART 21. S



21. S[illegible] Stry. Juvenile G. F

CASE 17.—*J. S. (convict). Paresis, male, age 50. Expansive type. Duration two years. Three intracranial punctures. Three Swift-Ellis and seven Ogilvie treatments. No change. Demented. (See Chart 20.)*

Paresis in a male convict, serving a sentence of from one to seven years for breaking and entering. When received at the prison, March 5, 1914, it was noticed that he was insane. At that time had delusions of wealth, and unable to work. He was committed to this hospital August 17, 1914, and at that time showed the classical symptoms of an expansive type of paresis. He was weak and was confined to bed. Completely disoriented, with defective memory and somewhat demented. No insight.

Physically.—Diminished knee jerks and Achilles. Localized weakness in lower extremities. Motor functions affected, tremors, unsteady gait, incoordination, Romberg symptoms, and pupils unequal, sluggish reaction to light.

Progress and Treatment.—Patient has not materially changed since admission. He was given three S.-E. and three intracranial punctures and seven O. M. treatments without showing any change whatever. He is in bed because of weakness and is still exhilarated, excited and much demented. The cell count has been modified by the treatment, dropping from 125 to 3, then increasing and now about 14. The globulin, which was 4+, decreased to +, then became 4+, where it remains. The Wassermann reactions in both blood and spinal fluid have remained persistently 4+. The case is still under treatment, but the prognosis is bad, as he is rapidly failing, both mentally and physically.

CASE 16.—*S. S. (see Chart 21). Juvenile paresis, male, age 24. Duration 1½ years. Demented, tabetic type. Fifteen Swift-Ellis and two O. M. treatments. No improvement. Dementing rapidly.*

Psychosis in a young man, age 24, with history of early peculiarities, unsociable, bad temper, but made a living at farm and factory work. A year before admission had a supposed sunstroke.

Onset.—About 18 months before admission gradually lost interest in work. Visual hallucinations probable. Admitted September 24, 1913.

Physical Examination.—Well-nourished man. General feeling of well-being. No subjective symptoms. Pupils dilated, sluggish reaction to light. Diminished patellar reflexes. Coordination not affected. Marked tremor of hands and tongue. Speech and writing defective.

Mentally.—Dull and stupid. Blank facial expression. Laughs and talks in a silly, foolish manner. Oriented for persons and time, but not for place. Memory defective. Grasp upon school knowledge poor. No insight, and judgment defective.

Treatment and Reactions.—Patient was given 15 Swift-Ellis treatments and two Ogilvie modifications. The cell count on admission was 78 and globulin +. Wassermann reaction in blood 4+, in spinal fluid 2+. After treatment the cell count dropped to 1, and globulin became negative. The Wassermanns, blood and fluid, both became negative and have remained so.

However, there was no improvement in his mental condition. In fact, he became more demented, so that at present he is unable to talk and presents the typical picture of the end stage of paresis. His physical condition is good and he has gained in weight. (See chart.)

CASE 19.—*W. P. Male, Russian Pole, age 28. Duration unknown. Demented type. Ten Swift-Ellis treatments. No clinical improvement. Reaction became negative, one year later all positive.*

Paresis in a Russian Pole, age 28. Nothing known of previous history. Became suddenly excited and delirious, with high temperature (104). On admission, September 4, 1913, was somewhat apprehensive, some delusions of persecution, and both auditory and visual hallucinations. Poorly oriented and memory defective. No insight, and judgment defective.

Physically.—Marked speech defect. Knee jerks exaggerated. Pupils, sluggish reaction to light. Other physical signs negative.

Reactions.—Lumbar puncture gave positive diagnosis, 20 cells per cc. with 4+ globulin. Wassermann, both blood and fluid, were 4+.

Treatment.—Patient was given ten Swift-Ellis treatments with no clinical results, but the cell count became normal and the globulin, blood and spinal fluid reactions all became negative. His treatment was discontinued for a year and tests made then showed that the cell count had increased to 76, the globulin and Wassermanns all strongly positive. Where the treatment has been discontinued as in this case, unless the treatment has been given long enough to eradicate the organism, there is always a tendency for the reactions to become strongly positive, thus showing that the negative results obtained during treatment were due entirely to the salvarsan and not to lumbar punctures merely.

CASE 20.—*J. M. (see Chart 23). Hungarian, male, age 47. Demented type. Duration nine months. Six Swift-Ellis treatments. No clinical improvement. Biological reactions influenced. A year later, without treatment, reactions strongly positive. Much demented.*

Paresis in a Hungarian man, age 47.

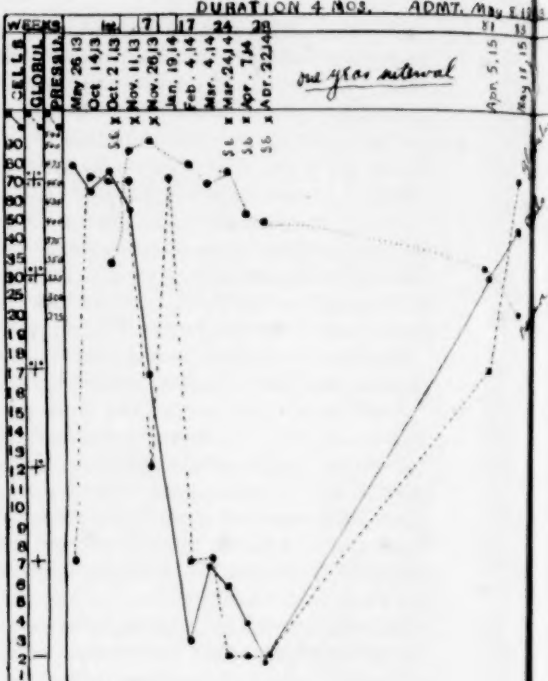
Personal History.—Came to United States six years ago. Illiterate, unable to read or write. Asphalt worker, earning $1.85 a day. Excessive alcoholic indulgences. Frequently intoxicated. Married 17 years ago, no children. No history of lues obtained.

Onset.—Nine months before admission. Left home and later became lost and picked up later by the police. Began to act queerly, collected rags and stones. Stopped work. Admitted May 8, 1913. Much demented and unable to speak English, so thorough examination impossible.

Physically.—Unequal knee jerks. Pupillary disturbances. Speech defects. Tremors.

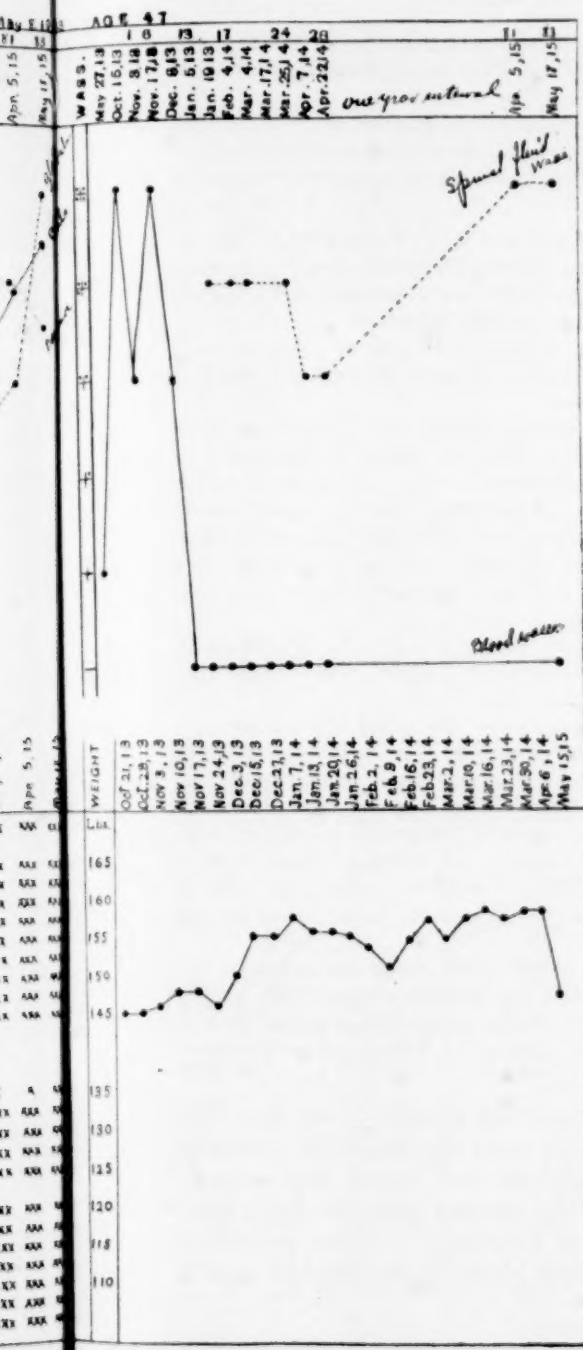
Reactions.—Lumbar puncture confirmed diagnosis of general paralysis. Cell count 80 per cc., globulin 4+, blood Wassermann 4+, after six months without treatment, and the spinal fluid Wassermann 3+. The cell count taken three times from May to October was 80, 70 and 80, respectively. After three treatments the cell count dropped to normal and the globulin

DURATION 4 MOS. ADMT. May 5 '13



CLINICAL	June 3 13	Apr 22,14	July 25,14	Sept ,14	Apr. 5, 15
DELUSIONS	XXX	XXX	XXX	XXX	XXX
HALLUCINA.					
ORIENTATION	XXX	XXX	XXX	XXX	XXX
MEMORY	XXX	XXX	XXX	XXX	XXX
SCHOOL KNOW.	XXX	XXX	XXX	XXX	XXX
CALCULATION	XXX	XXX	XXX	XXX	XXX
BEHAVIOR	XXX	XXX	XXX	XXX	XXX
PRES. IDEFT.	XXX	XXX	XXX	XXX	XXX
EUPHORIA	XXX	XXX	XXX	XXX	XXX
DEMENTIA	XXX	XXX	XXX	XXX	XXX
INSIGHT	XXX	XXX	XXX	XXX	XXX
PHYSICAL					
NUTRITION	XXX	XXX	X	X	X
PUPILS	XXX	XXX	XXX	XXX	XXX
VAGUE	XXX	XXX	XXX	XXX	XXX
SMELL	XXX	XXX	XXX	XXX	XXX
CUT. SENSIB.	XXX	XXX	XXX	XXX	XXX
ABSENT KJ.					
EXAG. KJ.	XXX	XXX	XXX	XXX	XXX
BOTCH FUNCT.	XXX	XXX	XXX	XXX	XXX
SPEECH	XXX	XXX	XXX	XXX	XXX
GAIT	XXX	XXX	XXX	XXX	XXX
TREMORS	XXX	XXX	XXX	XXX	XXX
WRITING	XXX	XXX	XXX	XXX	XXX
BOWELS	XXX	XXX	XXX	XXX	XXX

CASE 20. CHART 21. Jos



HART 2. JOSEPH MORAN. G. P.

became negative. The spinal fluid Wassermann remained at 3+ and then 4+, and after a year still strongly 4+. The blood Wassermann became negative, and has remained so even after a year.

Without treatment for a year the cell count has risen to 50 per cc. and the globulin 4+. This case, as in case 16, showed a return of all reactions to positive, with the exception of the blood Wassermann, when the treatment was discontinued.

CASE 21.—*L. V. (colored).* (*See Chart 24.*) *Colored man, age 46. Demented type. Duration one year. Seven Swift-Ellis treatments, three cerebral punctures, three Ogilvie method. No permanent improvement. Prognosis bad. Biological reactions markedly influenced.*

Paresis in a colored man, age 46. Nothing definite in family or personal history except that he received a blow on the head 18 years previous and that he never used alcohol. Married.

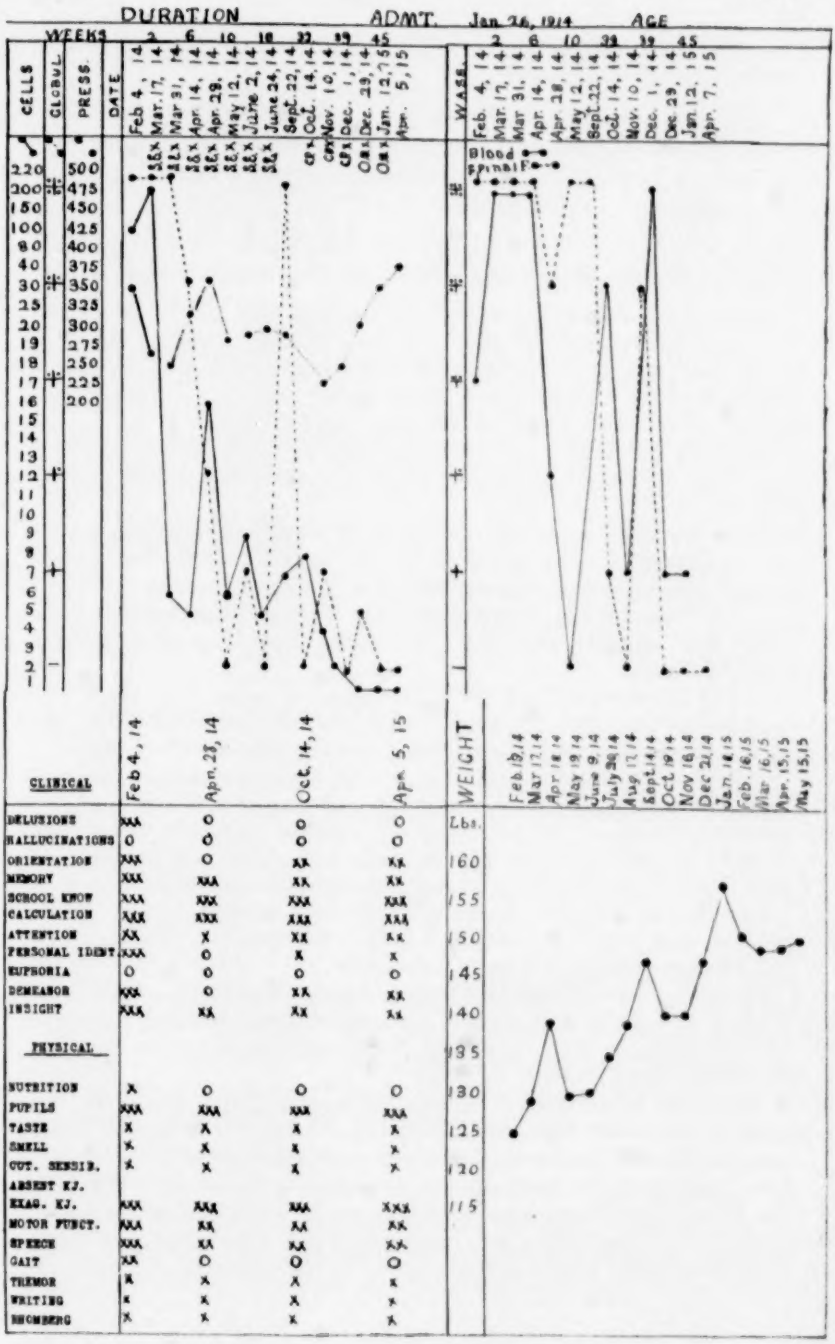
Onset.—About a year ago wife noticed patient was nervous and could not sleep, and frequently was unable to go to work. Lost interest in home and became forgetful. In September, 1913, had a shock which affected both lower limbs, but was not paralyzed. Became more irritable and was committed to the New Jersey State Hospital, January 26, 1914. On admission was oriented for time and place, but mentally was dull and stupid. Memory extremely poor and school knowledge defective. Insight and judgment poor. Evidently much deteriorated.

Physically.—Fair state of nutrition, weight 125 pounds. Pupils small and stiff to light. Smell and taste defective. Knee jerks exaggerated. Speech and writing defects. Gait unsteady.

Progress of Treatment.—Patient was given seven Swift-Ellis treatments with no clinical improvement, although there was a decided improvement in spinal fluid condition. The cell count dropped from 150 to 4 and the globulin content from 4+ to negative. Ten months after admission patient was given three cerebral punctures (Wardner technique). He became brighter mentally, but soon relapsed into previous demented condition. Later he was given two Ogilvie treatments, but without results, so treatment was discontinued. There was, however, a gain of 25 pounds in weight.

Reaction.—Marked improvement in cell count, which receded from 150 to 1, and a corresponding decrease in the globulin content from 4+ to negative. The Wassermann reactions in the spinal fluid remained at 4+, but became negative after cerebral punctures. The blood Wassermann also fluctuated, but finally became negative.

Discussion.—This case is interesting because of the fact that after seven Swift-Ellis treatments there was no clinical improvement, although cell count and globulin had become negative. In order to test the efficiency of the cerebral puncture three were performed after the method of Wardner. At first there was some improvement, but it was not lasting and at present patient



CASE 21. CHART 24. LEWIS VAL.

is much demented, untidy in habits and presents the typical picture of an end stage of paresis.

This was not a favorable case for the cerebral puncture and the fact that he did not respond to this method of treatment after failure of Swift-Ellis method does not disprove the efficiency of the cerebral puncture method. But it was a severe test, and had the cerebral puncture been successful it would have settled beyond a doubt the question of the advantages of the two methods.

CASE No. 34.—*G. O. (see Chart 25). Married man, age 37. Expansive maniacal type, spastic. Rapid progressive dementia. Duration one year. Only slight mental improvement after 12 Swift-Ellis treatments. Physically improved. Apparently demented. Prognosis bad. Two cerebral punctures (Wardner). One cerebral puncture (Cotton).*

Paresis in a married man, age 37, with negative family history. Uneventful personal history. Occupation, plasterer. Lues not ascertained from history.

Onset.—Gradual, about one year prior to admission. Became careless and indifferent in work and soon was discharged. He developed early marked expansive ideas, showed lack of judgment, and at first was easily controlled, wandered aimlessly about town. Suddenly became excited and violent, and was committed to the New Jersey State Hospital at Trenton, October 10, 1913.

Mental Examination.—On and since admission patient has talked continuously in unintelligent manner, saying over something that sounds like "Eine, meine, mine, mo." This is sung in a monotone all day long and it is difficult to obtain his attention long enough for him to answer questions. Then his productions show irrelevancy with marked and rather absurd expansive delusions. He was cross and irritable, frequently violent, and in order to treat him it has, with one exception, always been necessary to anæsthetize him, usually three times (intravenous injection, withdrawal of blood, and intraspinous injections). Apparently hallucinated at times. General mental organization shows marked deterioration. Disorientation and memory defects. Absolutely no insight.

Physically he was poorly nourished, but good musculature. Knee jerks exaggerated. Pupils stiff to light and marked arcus senilis. Taste and smell defective. Speech and writing defects and marked tremor of hands, tongue and facial muscles.

The course of the disease has changed but little since admission. He remained as above described. At times he would not sing and would answer questions, but usually incoherent, mistaking identity of those about him. Recently (after 14 months) he is quieter on the wards, will help to the extent of carrying trays at meal times, and dresses and undresses himself. He never enters into conversation and when questioned shows disorientation and lack of appreciation of his surroundings. He is appar-

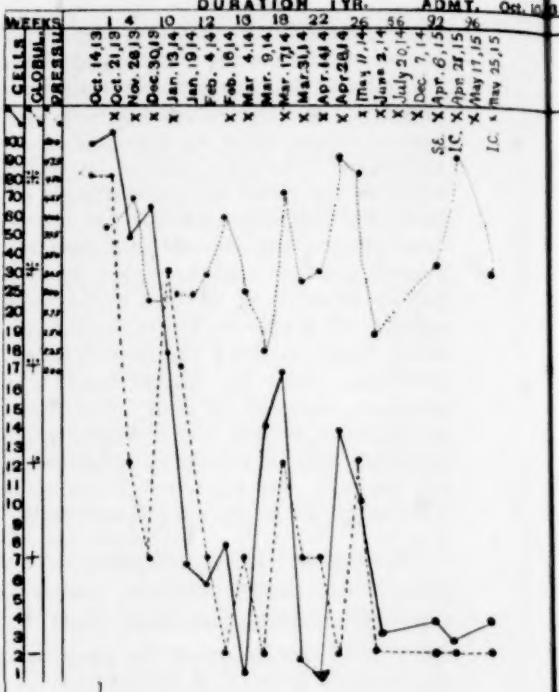
ently demented. He has improved physically (see chart). His weight has increased from 125 to 155 pounds, but physical signs have not changed.

Treatment and Reaction.—Patient has received 12 S.-E. treatments, all of which (with one exception) were given under anæsthesia. However, became violent when we attempted to treat him and had to resort to anæsthesia. While the physical improvement has been good, the mental condition has shown but slight change. But the biological reactions have been very favorably affected. The cell count dropped by gradual stages from 90 to 1 cell per cc., after eight treatments, then rose to 17, then normal, and later again to 16, but finally became normal. Because of his excited condition he has had no examination since June. The globulin content varied with the cell count, and to some extent was parallel to the latter, finally reaching negative. The Wassermann reaction was weak, positive in blood, and became negative after three treatments and has remained consistently so since. The spinal fluid Wassermann was negative on admission, became + + and later + + + +, finally becoming negative, and lately showing a tendency to become stronger as treatments have been less frequent. He was given a cerebral puncture (Cotton modification) April 28, 1915, but with no apparent results.

Discussion.—We are dealing here undoubtedly with a rapidly progressing disease process, which has made severe inroads in the cortex in a comparatively short time. The effect of the treatment has been to arrest the progress of the disease process, but the damage to the cortex has been so severe that no hope of any clinical improvement is possible. The biological reactions show that the spirochete can be eradicated, even though clinical improvement does not take place.

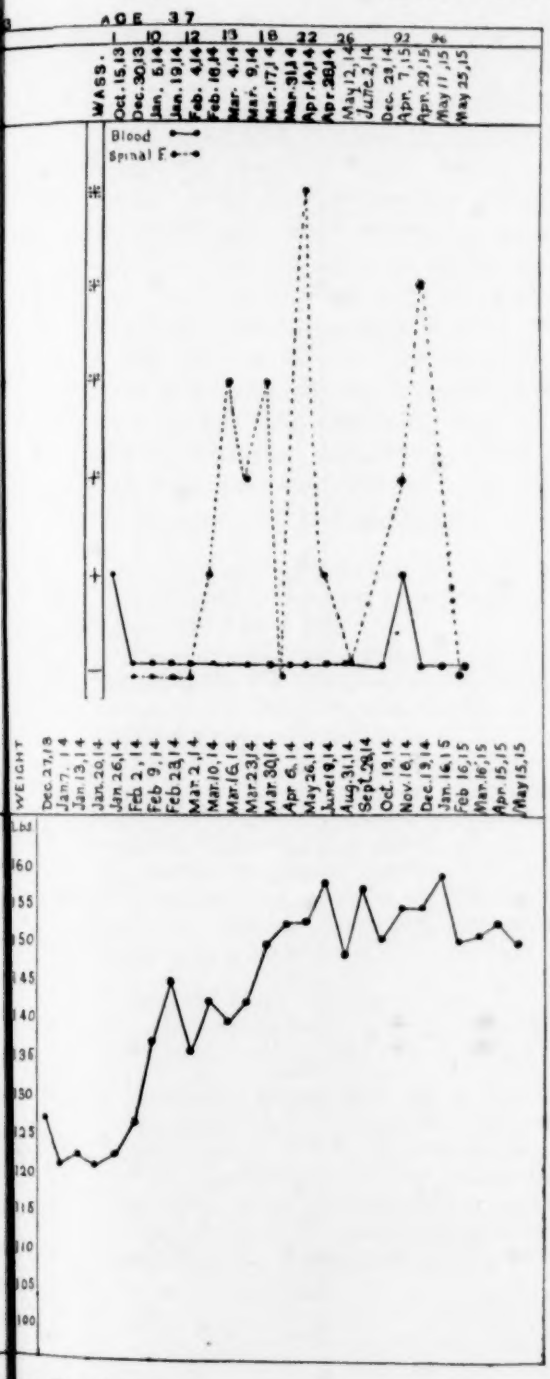
Group 4. Result Death. (6 Cases 19.5%.)

Seven cases have died during treatment and are here reported, principally to study the biological reactions in such cases. Six of these cases showed no improvement whatever; in fact, they were in the last stage of paresis when treatment was instituted and they were merely selected for experimental reasons; *i. e.*, to test the efficiency of salvarsanized serum in various stages of paresis. One case (31 H. L.) really belongs to the second group and has been placed in that group, as he had a distinct remission, finally succumbed to the disease. In the other six cases, however, there was no noticeable improvement clinically, although in all cases there was a decided improvement in the spinal fluid changes; *i. e.*, drop in cell count to normal and corresponding improvement

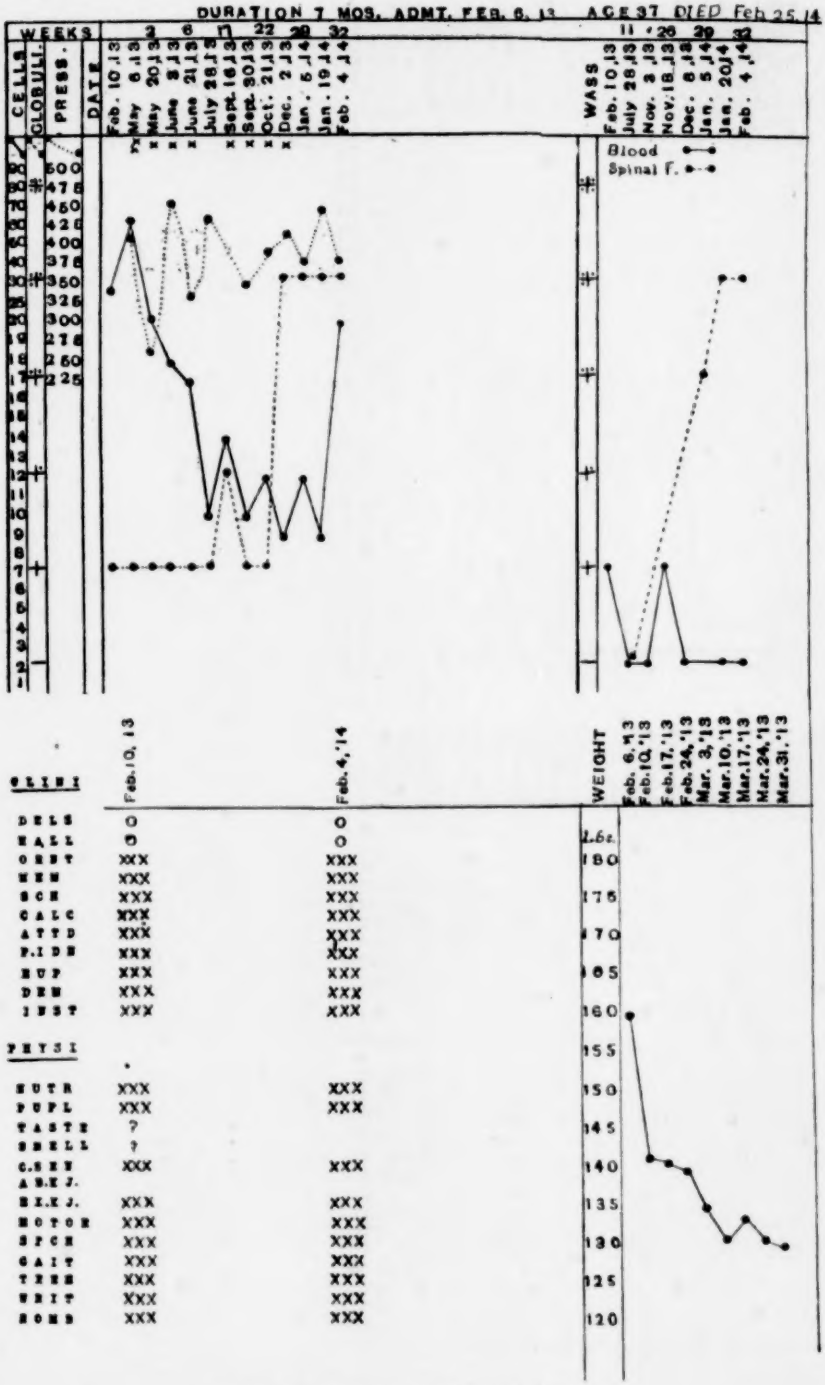


CLINICAL	Oct 15,13	Nov 19, 13	Mar 27,14	June 15,14	Sept 15, 14
DELUSIONS	XXX	XXX	XXX	XXX	XXX
HALLUCINA.	XXX	XXX	XXX	XXX	XXX
MEMORY	XXX	XXX	XXX	XXX	XXX
ATTENTION	XXX	XXX	XXX	XXX	XXX
ORIENTATION	XXX	XXX	XXX	XXX	XXX
PERS. IDENT.	XXX	XXX	XXX	XXX	XXX
SCHOOL KNOW.	XXX	XXX	XXX	XXX	XXX
CALCULATION	XXX	XXX	XXX	XXX	XXX
EUPHORIA	XXX	XXX	XXX	XXX	XXX
INSIGHT	XXX	XXX	XXX	XXX	XXX
PHYSICAL					
NUTRITION	XX	X	O	O	O
PUPILS	XXX	XXX	XXX	XXX	XXX
TASTE	XXX	XXX	XXX	XXX	XXX
SMELL	XXX	XXX	XXX	XXX	XXX
CUT. SENSIB.	O	O	O	O	O
ABSENT KJ.					
EXAG. KJ.	XXX	XXX	XXX	XXX	XXX
MOTOR FUNCT.	O	O	O	O	O
SPEECH	XX	X	X	X	X
GAIT	O	O	O	O	O
CONVULSIONS					
ROMBERG	O	O	O	O	O
WRITING	X	X	X	X	X
TREMOR	X	XX	XX	XX	XX

WEIGHT
Lbs
160
155
150
145
140
135
130
125
120
115
110
105
100
95



CHAR 25. GEO. OSW.



Case 25. Chart 26. Robt. Mt. G. P.

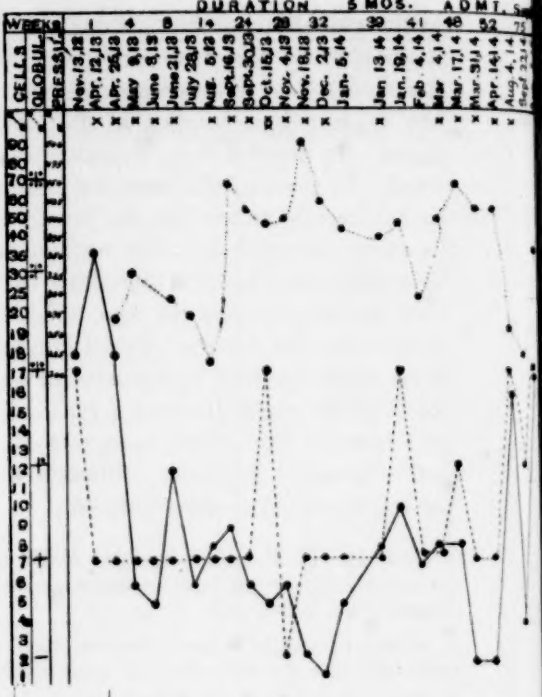
in the globulin content. In one case (25) the globulin increased in strength to 3 + from negative. In all cases except one (26) the spinal fluid Wassermann became stronger towards the end, but Wassermann reaction in the blood remained but little influenced. In none of these six cases was there any clinical improvement. In three of the cases the patients were bed-ridden and had to be literally carried to the operating room. In two of them, however (22 and 24), the sudden death following intravenous injection was disconcerting until the autopsy revealed the fact that the disease process was much further advanced than one would estimate by the clinical condition of the patient. In all cases the duration before treatment was over a year and the cases were of the rapid dementing type. Two of these cases (31 and 26) were of the tabetic type, one of which (31) had a distinct remission, and the other, although of shorter duration, showed no improvement under treatment.

CASE 25.—*R. M. Male, age 37. Rapid dementing type, and treatment 11 months after onset, with no improvement after eight treatments. Result death. (See Chart 26.)*

A case of well advanced paresis at time of admission, February 6, 1913, although time was only given as seven months. He was given eight treatments (Swift-Ellis), but with no effect upon clinical symptoms. The cell count was reduced from 60 to 9, but the globulin, after being a weak positive for several months, increased under treatment to 3 +, and later the cell count increased to 20. The spinal fluid Wassermann steadily increased from negative to 3 +, while the blood Wassermann became negative. This case was treated without much expectation of producing any change in patient's condition. He became rapidly worse and died February 25, 1914, one year after admission. Whole duration one year and seven months, considerably less than average duration of paresis, which is three years.

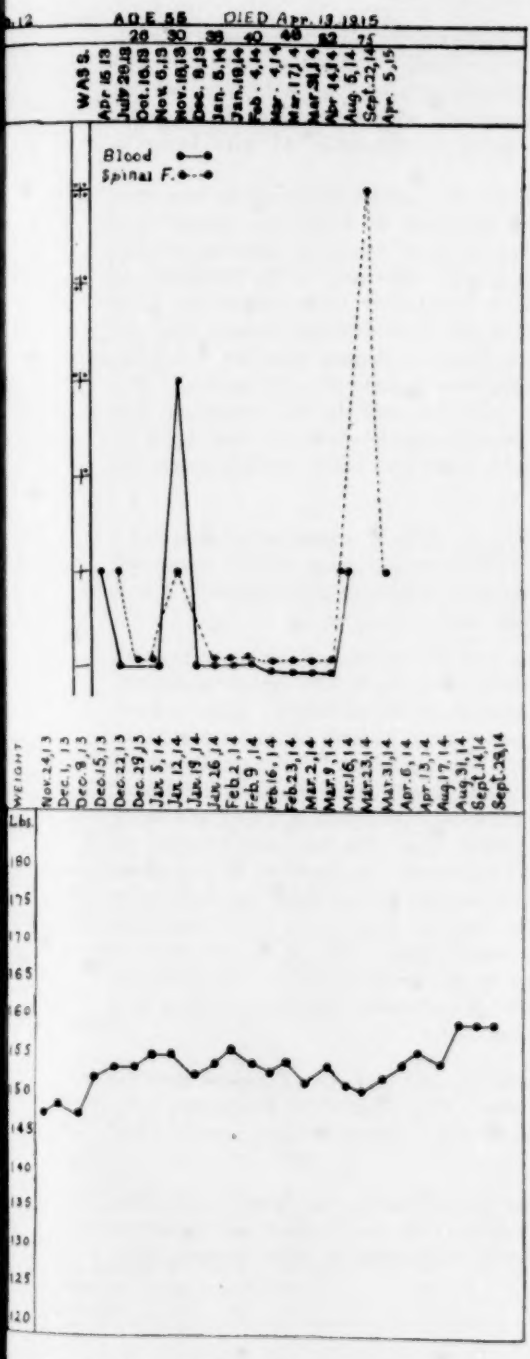
CASE 18.—*C. C. A colored man, age 55. Expansive demented type. No improvement after 18 Swift-Ellis treatments. Duration one year before treatment. Death. (See Chart 27.)*

Paresis in a colored man, age 55. Married and had seven children, all living, except one who died at 6 months. Onset was gradual with loss of memory, change of disposition for five months. Upon admission, September 30, 1912, marked expansive ideas and extravagance and excessive alcoholism. When admitted physical examination showed sluggish pupils, complete arcus senilis, exaggerated knee jerks, tremors of eyelids, tongue, lips and hands. Writing and speech defective.



CLINICAL	Oct. 2,12	Sept.13,13	Mar.27,14	July 15,14
DELUSIONS	XXX	XXX	XXX	XXX
HALLUCINA.	O	O	O	O
DEMEANOR	XXX	XXX	XXX	XXX
ORIENTATION	XXX	XXX	XXX	XXX
PERS. IDENT.	XXX	XXX	XXX	XXX
SCHOOL KNOW.	XXX	XXX	XXX	XXX
CALCULATION	XXX	XXX	XXX	XXX
EUPHORIA	XXX	XXX	XXX	XXX
INSIGHT	XXX	XXX	XXX	XXX
MEMORY	XXX	XXX	XXX	XXX
PHYSICAL				
NUTRITION	X	O	O	O
PUPILS	XXX	XXX	XXX	XXX
TASTE	X	X	X	X
SMELL	X	X	X	X
CUT. SENSIBIL.	XX	XX	XX	XX
ABSENT KJ.				
EXAGG. KJ.	XXX	XXX	XXX	XXX
MOTOR FUNCT.	XXX	XXX	XXX	XXX
TREMOR	XXX	XXX	XXX	XXX
SPEECH	XXX	X	X	X
WRITING	XXX	XX	XX	XX
GAIT	XX	XX	XX	XX
NUMBERS	XX	XX	XX	XX
CONVULSIONS	O	O	O	O

CASE 18. CHART 27.



T 27. CAS. CONOV. COL. G. P.

Mentally.—Violent and restless with no appreciation of his surroundings. Marked exhilaration, feeling of importance, delusions of grandeur and wealth (money and diamonds). Disoriented for time and place, but not for persons. Marked memory disturbance, with fabrications of the polyneuritic delirium type. Tells of going to Princeton, of wife being in the hospital. No insight.

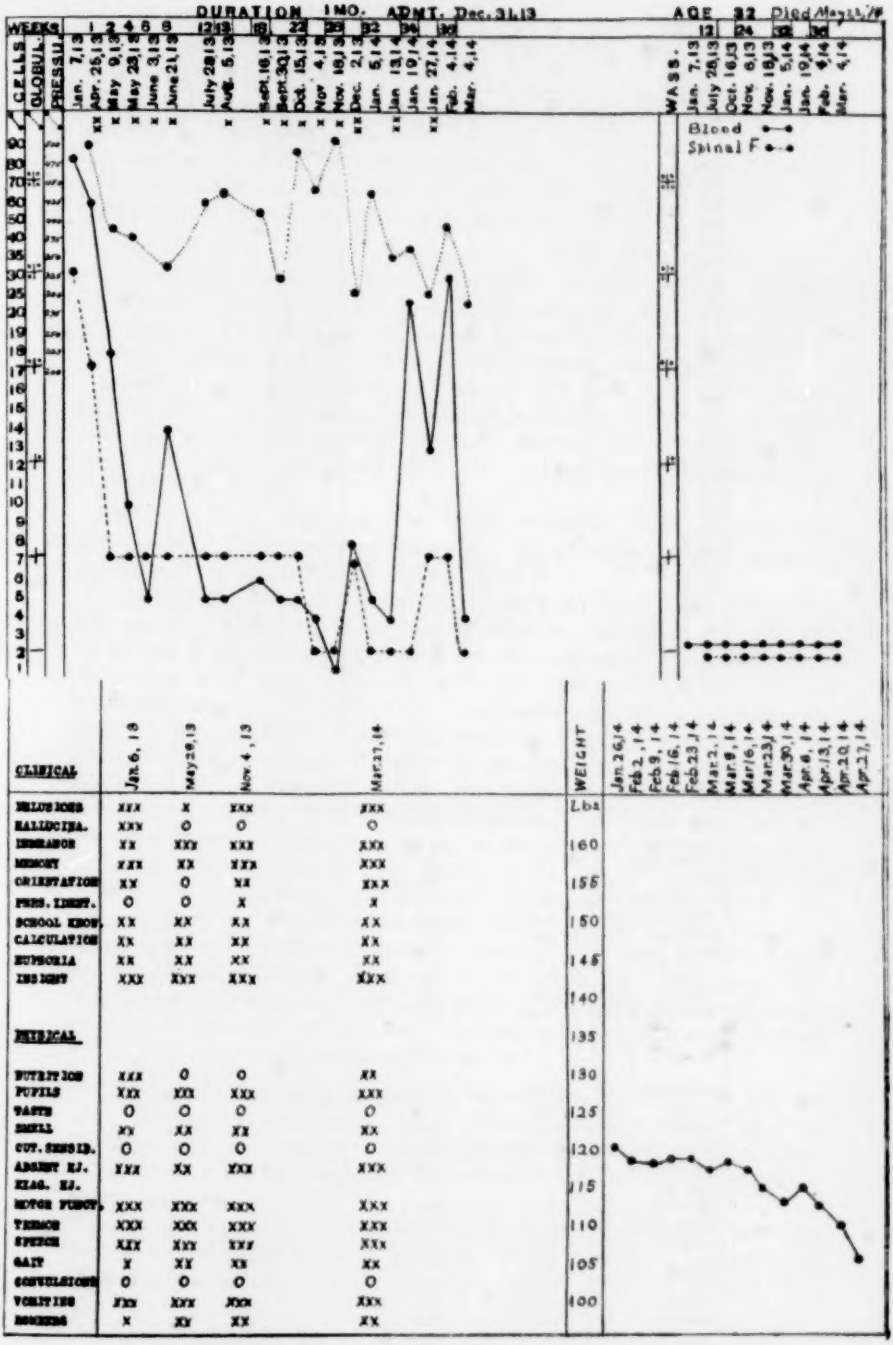
Progress.—Patient was treated by the Swift-Ellis method, treatment begun about a year after onset of psychosis, at which time patient was in a state of moderate deterioration or in an advanced stage of paresis. The biological reactions were considerably influenced by the treatment, as the cell count was reduced from 35 to 2, after some fluctuation. The Wassermann reactions in blood and spinal fluid were not pronounced, and at first were barely positive. Both reactions became negative, but after 18 treatments the spinal fluid Wassermann became strongly positive. His physical condition was influenced and improved by the treatment, but mentally, after the first month, he became steadily worse and died April 13, 1915, the whole duration being three years and eight months, about the average duration for paresis.

CASE 26.—*U. J. Colored man, age 32. Tabetic, rapidly dementing type. Fourteen Swift-Ellis treatments. Duration one year before treatment. No improvement. Died five months after treatment discontinued. Whole duration two years and five months.* (*See Chart 28.*)

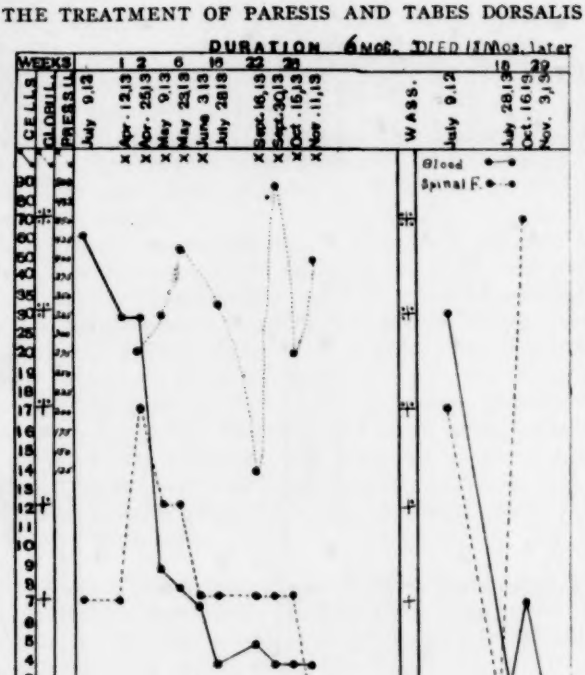
Paresis in a colored man, age 32, with history of syphilis 14 years prior to onset, which was one year before admission. The tabetic symptoms preceded the mental symptoms by several months or longer. Able to work as a waiter up to a month before admission, although he was extravagant and vain, thought white girls were in love with him. Sudden outbreak of hallucinations. Committed to the New Jersey State Hospital, December 31, 1912, and on admission showed the mental symptoms of a well advanced, expansive, demented paretic of tabetic type. He was not affected by treatment, although he was given 14 injections. At one time he was given three treatments with a heterogenous serum, and as noted in other cases the cell count showed an appreciable increase (from 5 to 40). Treatment was discontinued and he died five months later. This is another case of tabo-paresis which did not respond to treatment as he was too demented when treatment was instituted. The Wassermann reactions in blood and spinal fluid were persistently negative.

CASE 23.—*F. C. Expansive, demented case, age 52. Eighteen months' duration before treatment. Bedridden. Nine Swift-Ellis treatments. No improvement, gradually failed and died. Duration two years. (See Chart 29.)*

A case of paresis in a man, age 52, expansive type, who had become rapidly demented after entering hospital. He was bedfast and treatment was instituted without much hope of improvement, eight months after



CASE 26. CHART 28. UPTJN JOH. COL. TABETIC G. P.



CLINICAL	June 26/12	Apr 12,13	Nov 11,13
DELUSIONS	XXX	XXX	XXX
HALLUCINA.			
ORIENTATION	X	XXX	XXX
MEMORY	XXX	XXX	XXX
SCHOOL KNOW.	XXX	XXX	XXX
CALCULATION	XXX	XXX	XXX
EUPHORIA	XXX	XXX	XXX
PERS. INSPT.	X	XX	XXX
INSIGHT	XXX	XXX	XXX
DEMENTIA	X	XX	XXX
DEMEANOR	XXX	XXX	XXX
PHYSICAL			
NUTRITION	X	XXX	XXX
PUPILS	XXX	XXX	XXX
TASTE	XXX	XXX	XXX
SMELL	XXX	XXX	XXX
CUT. SENSIB.	XX	XX	XXX
ABS. KJ.			X
EXAGG. KJ.	XXX	XXX	XXX
MOTOR FUNCT.	XXX	XXX	XXX
SPEECH	XXX	XXX	XXX
GAIT	XXX	XXX	XXX
TREMORS	XXX	XXX	XXX
WRITING	XXX	XXX	XXX
SCANNING	XXX	XXX	XXX

CASE 23. CHART 29. FRANK CARPT. G. P. AGE 52

admission. He had to be taken out of bed and carried to the operating room for every treatment. He had nine Swift-Ellis treatments, but failed rapidly and died after 18 months in the hospital. The treatment in this case had no affect whatever on the disease process and autopsy showed an end stage of paresis. The cell count and globulin were reduced to normal and Wassermann reactions were also considerably influenced, but the spinal fluid reaction towards the last became strongly positive.

CASE 24.—*O. J. Swedish man, age 55. Onset three months before admission and 15 months before treatment. Expansive type. Physical signs well marked. Given six Swift-Ellis treatments. No change, several convulsions. Died two days after last treatment. Autopsy showed well advanced paresis in cortex and weak, flabby heart.* (*See Chart 30.*)

Paresis in a single Swedish man, age 55, with rapid onset three months before admission. Mentally somewhat expansive at first, but later rather dull and stupid, with marked memory defects. No conduct disorder, social on ward. Fairly well oriented. School knowledge fairly well retained. No insight.

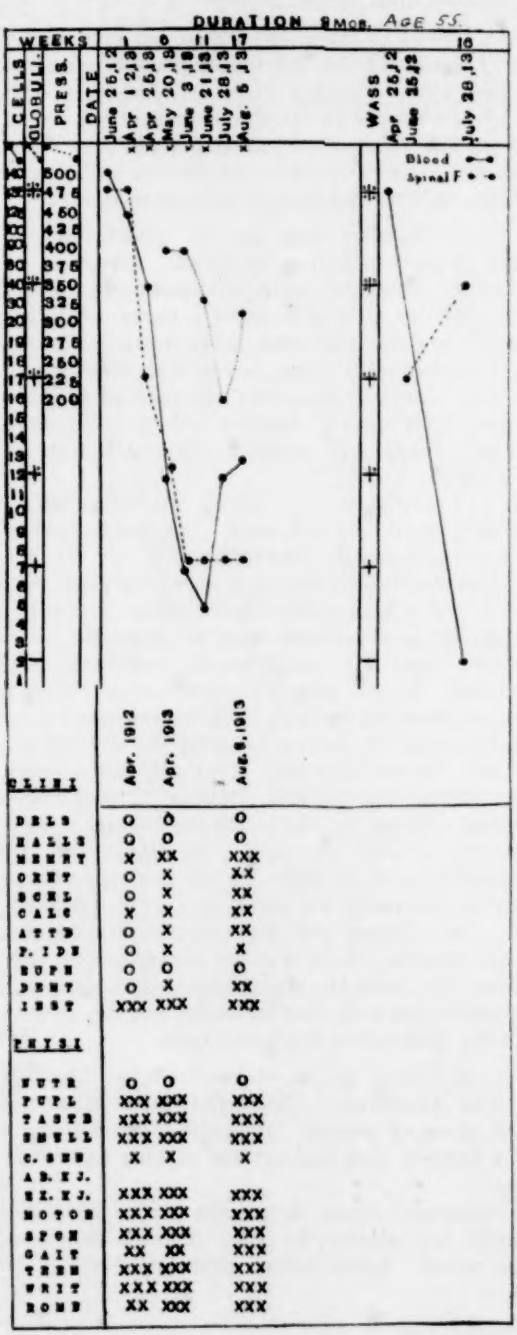
Physically, well nourished (210 pounds weight). Pupils unequal and stiff to light. Defective taste and smell. Cutaneous sensibilities impaired. Speech and writing defective. Unsteady gait.

Progress of Case.—Patient remained about the same for a year after admission. He had not materially failed either physically or mentally, so he was regarded as a favorable case for treatment, which was begun 15 months after onset. He was given six treatments (S.-E.) with no appreciable change. He had several convulsions just before last treatment and after last treatment he suddenly went into a comatose condition, after a convulsion following the intravenous injection, and did not rally. Died three days later. Temperature 105. His death was rather a surprise, as he appeared to be in good physical condition. But the autopsy revealed the cause beyond a doubt. In the cortex the changes were those of well-advanced paresis. Hardly any section of cortex was free from the process. It seemed hardly possible that the patient could appear so little affected when the process in the cortex was so far advanced. The heart was found to be enlarged and the muscles soft and flabby, marked myocardial degeneration. So it was not surprising that the patient died. The convulsions were probably superinduced by the treatment. Only one other case of paresis has died after treatment, and the second one, reported below, died after intravenous treatment alone.

CASE 22.—*L. M. Male, age 40. Demented type. Duration 19 months. Two Swift-Ellis treatments. Died after third intravenous injection. Autopsy, well advanced paresis. Myocardial degeneration. Focal type.*

Paresis in a married man, age 40, with nothing unusual in personal or family history.

Onset of Psychosis.—About 19 months before admission. Gradually became forgetful, lost affection for wife. Slight fainting attacks, affecting right side and speech. Speech became thick and slurring. Unsteady gait.



	Apr. 1912	Apr. 1913	Aug.6,1913
DELS	O	O	O
HALLS	O	O	O
HENRY	X	XX	XXX
ORBT	O	X	XX
SCHL	O	X	XX
CALC	X	X	XX
ATTD	O	X	XX
P. IDS	O	X	X
RUFN	O	O	O
DENT	O	X	XX
INST	XXX	XXX	XXX
PHYSI			
MUTR	O	O	O
PUPL	XXX	XXX	XXX
TASTE	XXX	XXX	XXX
SMELL	XXX	XXX	XXX
C. SNS	X	X	X
AB. R J.			
BR. R J.	XXX	XXX	XXX
MOTOR	XXX	XXX	XXX
SPCH	XXX	XXX	XXX
GAIT	XX	XX	XXX
TREM	XXX	XXX	XXX
WRIT	XXX	XXX	XXX
ROMB	XX	XXX	XXX

CASE 24. CHART 30. OSCAR JOHN. O.

Admitted September 17, 1913. Mentally he was somewhat demented, indifferent and apathetic. Defective orientation. Memory defective. No delusions. Marked paraphasic speech disturbances. No insight.

Physically.—Well developed and well nourished, weight 142 pounds. Pronounced ptosis of both eyelids. Pupils irregular and unequal, sluggish reaction to light. Tremor of facial muscles, lips, tongue and fingers. Marked incoordination of movements. Unsteady gait, swaying in Romberg. Exaggerated knee jerks. Pain sense dull.

Progress of Case.—Patient had two Swift-Ellis treatments, but with no appreciable change in his condition. The cell count on admission was 18, globulin 4+, blood Wassermann 4+, and fluid Wassermann 4+. The cell count dropped to 11 and the globulin to +, and the Wassermann reaction remained unchanged.

The third treatment was given a month after the second. Previous to this all cases had been given neo-salvarsan, but this patient was given salvarsan. He seemed all right after the injection, and the next morning appeared as usual. He was up and dressed, but he became weak and was put to bed. Rapidly became unconscious, collapsed and died at 9.45.

The autopsy showed a well-advanced paretic process in the cortex, slight focal lesion over left hemisphere. Heart large and flabby, very anemic in color, myocardial degeneration.

The sudden death of this case was unusual, the only one in the series dying under intravenous injection of salvarsan. But the heart condition accounted for the sudden death. The case is similar to case 24, both cases having marked myocardial changes.

The patient was referred for treatment by Dr. I. Arthur Booth, of New York.

Locomotor Ataxia.

Unfortunately we have treated only a small number of locomotor ataxia cases. Altogether we have had only four cases, due to the fact that these patients, not having any mental trouble and not committed to the State Hospital, do no seek treatment here. The ages of these four cases were 48, 55, 61 and 70, respectively. From the advanced age of these patients it will be seen at once that the tabetic condition was in the end stage when they came under observation. In fact, the duration of two of these cases was 12 years, one 5 years and another 1 year. In spite of the long duration of the tabetic process three of the cases have shown very marked improvement. This is especially noticeable in case 29, a man 61 years old, in which the tabetic process was of 12 years' duration and for the last two years the patient was a helpless invalid, bed-fast, with no control of the bladder. The result

of the treatment in this case was better than in the other three, and now after two years has elapsed since treatment was begun he has no more bladder trouble, can walk fairly well with a cane and goes to the city at will, and in general his condition is quite comfortable. The knee jerks which were absolutely absent when treatment was begun can be obtained slightly at the present time and the pupils react apparently better to light. Another case which showed marked improvement (case 28) had shown symptoms of tabes for one year only previous to treatment and after a period of nine months he also has shown marked improvement. When treatment was instituted he could not stand alone, had to be carried to the operating room. At the present time he walks up and down steps with the help of a cane, and his general condition is also better. The gait is still typically tabetic, while in case 29 the gait is more of a feeble character and would not impress one as being tabetic on observation. The third case, 48 years of age (case 27), is also a long case, 12 years' duration, but apparently of very mild symptoms until a year ago, when condition became rapidly worse. He has improved very much under treatment, although he is still in the hospital and undergoing treatment. In these three cases it can be said of the result that it was highly satisfactory, but we cannot claim that they are cured, as it is doubtful if they will ever be any better, but the symptoms have diminished very much, especially the gait and pupillary disturbances, so that they are comfortable, able to be up and about instead of being helpless bed-patients. In the fourth case the result was not so satisfactory. The man was 70 years of age and the duration was placed at five years, although probably longer. He showed rather severe reaction to treatment and altogether has only four treatments with a year's interval between the first two and the last two. There has been some improvement in his condition but very little.

Biological Reaction in Tabes.—From the four cases we have examined and treated there seems to be a marked deviation of the biological findings from cases of general paralysis. In two of the cases (27 and 63) the cell count was negative and the globulin also negative. In case 27, however, the cell count rose as high as 30 under treatment and globulin became 2 +. In the other two cases the cell count was fairly high and globulin con-

tent strongly positive, and both were reduced to normal by the treatment. The Wassermann reactions also show important deviations. In all four cases the Wassermann in the blood has been negative or barely positive and the same can be said of the spinal fluid reaction. The fact that the Wassermann reactions are negative and in two of the cases cell count and globulin negative, would seem to indicate that the active inflammatory process had subsided, that we are dealing with end stages in which the spirochetes had spontaneously been destroyed or in some way had spontaneously disappeared. This condition is analogous to the conditions found in prolonged cases of paresis of stationary type, where there is also a tendency for the reaction to become negative. In the case treated where the reactions have all been negative, while there has been some improvement, the result has not been as successful as in cases in an acute condition, and in these cases the reactions to the treatment have been rather severe.

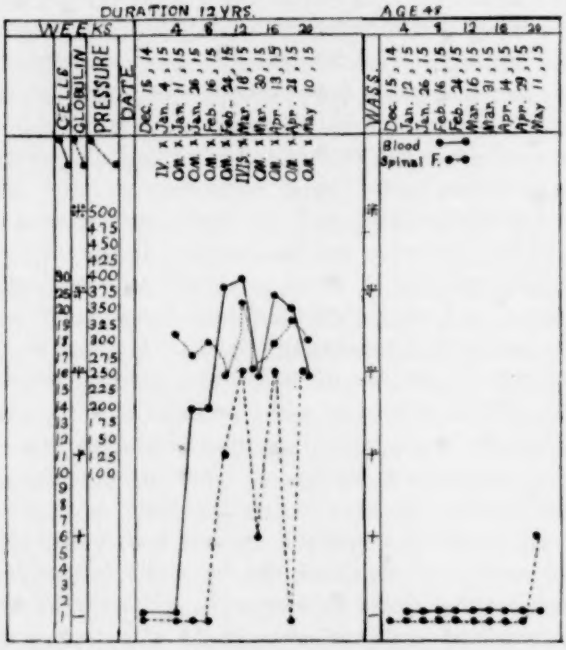
Treatment.—Our tabetic cases have been treated with both S.-E. and Ogilvie methods and the latter method seemed to be more successful, for there was less reaction to the treatment and the result seemed better. From our rather limited number of cases we are forced to conclude that these cases should be treated very mildly and not too frequently. In case 29 where we obtained the best results two treatments were given in 1913, which caused a remission of the symptoms and this lasted until a year later, when the bladder symptoms returned and treatment was again given. Here again four treatments over two weeks apart produced good results. In case 27, on the other hand, nine treatments have been given at periods no less than two weeks apart with good results. In this case the cell count became increased to 30 per cc., and globulin became 2 +, while the Wassermann reactions remained negative, we are of the opinion that the treatment should be modified to suit each individual case of tabes, and this modification should depend upon the clinical condition and the biological findings. In the more acute stages of the disease it is possible the treatment outlined by S.-E. would be more efficient. Unfortunately we have not had an opportunity to treat these types. Our experience with tabetic types is somewhat similar to our experience with the cases of tabo-paresis, where we found they could not stand very intensive treatment.

The results of the treatment were found to be more successful when treatment was given at long intervals and very small doses.

CASE 27.—*C. S. Locomotor Ataxia. (see Chart 32). Tabes in a man 48 years of age, 12 years' duration. Lues 25 years previous. Eight Ogilvie treatments, bi-weekly intervals. Result, good.*

Locomotor ataxia in a man, age 48, with negative family history. Had syphilis 25 years ago, for which he was treated thoroughly and pronounced cured by physician.

Onset of Tabes.—About 12 years ago. He suddenly developed lightning pains in legs and has had them at varying intervals since. Frequent girdle pains. Six months before admission to the hospital became rapidly worse,



CASE 27. CHART 32. CHAS. S. TABES.

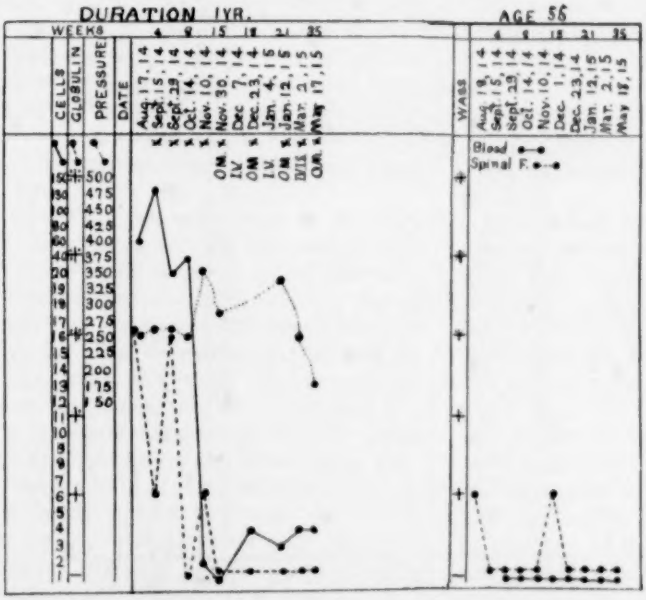
unable to get about, and had to stop work. Admitted here December 5, 1914.

Physically, he was well nourished, weighing 140 pounds. Shooting pains in legs. Smell good. Pupils unequal and stiff to light. Hearing defective. Taste not impaired. Cutaneous sensibilities defective, both pain, touch and heat and cold impaired. Knee jerks and Achilles reflex absent. Romberg symptom. Incoordination, but gait fairly steady.

He exhibited no mental symptoms of paresis or other psychosis, but was depressed over his condition. Lumbar puncture gave absolutely negative findings. Cell count was less than 1. Globulin negative. Blood and spinal fluid Wassermann have been persistently negative. He was given the Ogilvie method and has had eight treatments at bi-weekly intervals. The cell count after first treatment has gradually increased, once reaching 30 per cc., and the globulin has also become positive, as high as 2 +, and five months after treatment was begun the spinal fluid Wassermann was weakly positive.

Colloidal Gold Reaction.—1 1 2 1 0 0 0 0 0 0 0.

The patient has shown considerable improvement in his physical condition. He has gained in weight and has had no shooting pains. His gait is better and incoordination not so marked. He is much more cheerful. Treatment is being continued and the prognosis is good, in spite of the fact that the case is of long duration and the process was probably quiescent.



CASE 28. CHART 33. JOS. ELL. W. TABES DORSALIS.

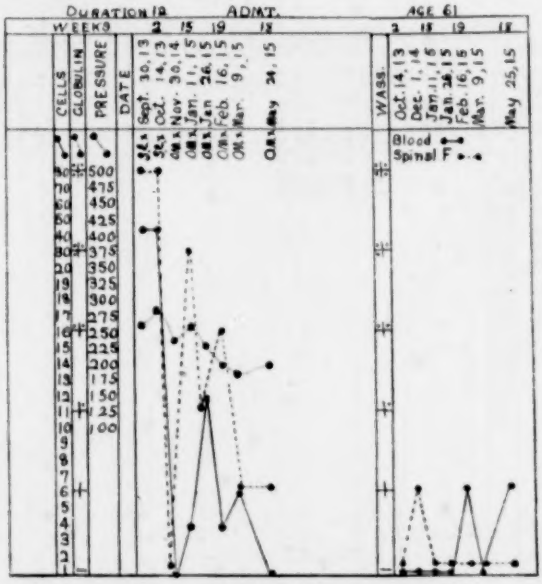
CASE 28.—*J. E. Locomotor Ataxia (see Chart 33). Tabes. Male, age 55. Duration one year. Lues 12 years. Rapid case, unable to use legs, marked incoordination and lightning pains. Eight Swift-Ellis, four Ogilvie treatments. Marked improvement. No mental symptoms.*

Tabes in a man 55 years of age, with history of luetic infection 12 years ago. Occupation laborer. Married, but no children. Onset about one year ago. First symptoms tingling and numbness of legs and some diffi-

culty in walking. Soon had lightning pains and had to give up work. Came to hospital for treatment August 17, 1914. At that time he could not walk and had to be assisted by attendants. It was impossible for him to walk upstairs and had to be carried to the operating room. He was given eight S.-E. treatments and four Ogilvie at intervals varying from two weeks to a month. He had some pain after each treatment (of both methods), and the treatments often had to be discontinued for a few weeks. However, he gradually improved and after about eight treatments he could walk upstairs and about the wards with the help of a cane, and can at times walk without any cane or other assistance.

Biological Reaction.—Before treatment the cell count was 150, and then gradually decreased to 4 per cc. The globulin was 2+ on admission and gradually became negative. The blood Wassermann has always been negative and the spinal fluid Wassermann was either (±) or negative.

Colloidal Gold Reaction.—4 4 4 4 3 3 3 2 1 1 0.



CASE 29. CHART 34. GEO. ST. TABES DORSALIS.

CASE 29.—*G. S. Locomotor Ataxia (see Chart 34). Tabes in a male, age 61. Duration 12 years. Voluntary commitment. Totally deaf. For two years bedfast, unable to stand alone. Much emaciated. Great improvement after two Swift-Ellis treatments. One year's remission, treatment interrupted.*

Locomotor ataxia in a married man, age 61. Nothing unusual in personal history. Date of luetic infection not known. Onset of tabetic symptoms about 12 years before treatment. Gradually lost control of legs and hearing

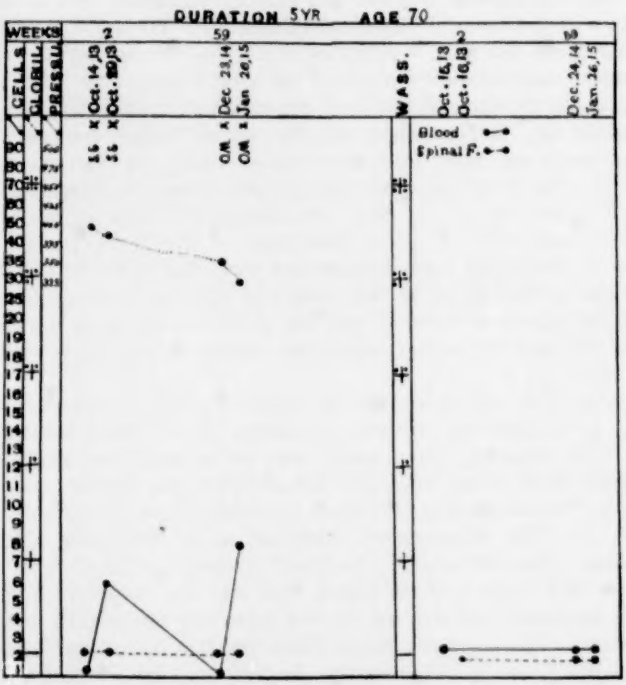
became impaired. His symptoms made slow progress but steady, and for about two years he has been unable to work and had to go to bed because of his inability to walk. He lost considerable weight. He also had severe bladder disturbances, constant dribbling of urine, and no impulse to urinate. He was seen in consultation with Dr. G. H. Parker, of Trenton, in September, 1913. At that time he was unable to stand alone. Knee jerks were absent and pupils stiff to light. Marked incoordination. He was advised to come to the State Hospital as a voluntary patient for treatment. He was given two Swift-Ellis treatments with two weeks' interval between the first and second treatments. He became dissatisfied with the hospital surroundings and left. He had no other treatment for about one year. In the interval he gained 30 pounds in weight and showed marked improvement of his tabetic symptoms. He was able to walk about the city with the help of a cane and his bladder disturbances had cleared up. In November, 1914, he had an Ogilvie treatment, as his bladder symptoms were becoming worse. Otherwise he was in good condition. The next treatments were given January 11, January 16, January 26, February 16, and March 9. He continued to improve, but evidently the treatments were given too rapid and he had a moderately severe reaction, so treatments were discontinued until May, when he had the last. The result of treatment in this case was entirely satisfactory, and at present the patient walks quite well and is able to get about the city with a cane. His gait at present would not suggest tabes, but is more of a feeble type.

Reaction.—The cell count was 50 when treatment was begun and the globulin 4+; after the first two treatments the cell count became 1 and the globulin negative. In a year's interval without treatment the cell count had changed but little, but the globulin had become 3+. After subsequent treatments the cell count gradually came to normal and the globulin ±. The Wassermann reactions, as in practically all of our tabes cases, were very weak. The blood Wassermann was negative when treatment was begun and the spinal fluid was also negative. The blood reaction continued negative but on two occasions was slightly positive.

Prognosis.—While no one would claim that this patient had been cured of locomotor ataxia, at the same time the treatment has changed a helpless, bedfast, untidy invalid to a man able to be up and about, able to go around the city and take trips with his wife to Maine, etc. Altogether, the result of treatment can be said to be entirely satisfactory. He is still under treatment, although it is doubtful if much more can be accomplished except to help his bladder symptoms, which show a tendency to recur. His deafness remains unchanged. The knee jerks show slight reaction continued negative but on two occasions was slightly positive.

CASE 63.—*K. Locomotor Ataxia (see Chart 35). Tabes in a man, age 70. Duration five years. Cell count, globulin, and Wassermann reactions negative; four treatments. Severe reactions. Some improvement. Unfavorable prognosis.*

The beginning of the symptoms of tabes in this patient was placed at five years, but probably they were of much longer duration. He had taken all sorts of treatment, electricity, hydrotherapy, osteopathy, chiropractic and mechanotherapy, and finally plain massage. But in spite of all these cults he was gradually getting worse. He was seen in October, 1913, at which time he had absent knee jerks, stiff, contracted pupils, marked incoordination, typical tabetic gait, unable to walk without assistance. He also had various paresthesias, especially in fingers and toes, accompanied by numbness. There were no mental symptoms present.



CASE 63. CHART 35. TABES.

The cell count was negative (less than 1 cell per cc.), the globulin persistently negative, and both blood and spinal fluid Wassermann were and have been persistently negative. He was given two Swift-Ellis treatments in October, 1913, two weeks apart. After the second treatment patient had a severe reaction. He had to go to bed for several weeks and was quite collapsed, with severe headache and fever. He probably had an acute irritative meningitis, as the symptoms shown were the same as in two other cases (not tabes) who had such a condition. He recovered after this and no treatments were given for a year. In December, 1914,

and January, 1915, he had respectively two Ogilvie treatments. The cell count after the second treatment increased to 8, but the other reactions remained the same.

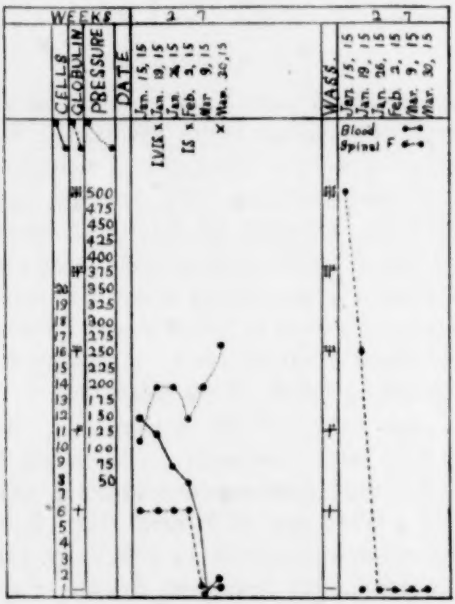
Results.—The effects of treatment in this case have not been very marked, but the patient is in better physical condition. His disease has made no progress in the last 18 months, but the reactions to treatment were so severe that he refused to go on. The negative biological reactions in this case probably indicate that the active process has ceased; that the spirochetes are no longer present in the cord or membranes, and that we are dealing with the end stage or resulting damage without the presence of spirochete pallida, at least this assumption is justified by the results of treatment.

Luetic Meningitis.

We have treated so far three cases of luetic meningitis, two of the chronic type and one an acute condition. The acute case occurred in a boy 19 years of age (case 32) with history of luetic infection six months previous. He had one intravenous injection of salvarsan followed by mercurial treatment at that time. He had two S.-E. treatments with rapid recovery and is at present, 12 months later, entirely well. The cell count in this case was 700 per cm. with 4 + globulin and spinal fluid Wassermann 2+, and blood Wassermann+. He gained 20 pounds in weight and has had no return of the symptoms.

The second case (58), a baby, 4 years old, with history of similar nature two years previously. (See chart 37.) He had convulsions at that time, but seemed to improve, although he was never quite well. When seen in January, 1915, he was in a dull, stupid, restless condition, unable to talk, kept his body in an opisthotonos position. He improved rapidly under two S.-E. treatments with very small doses of salvarsan. The cell count in this case was low, 12 per cm., and very low globulin. Spinal fluid Wassermann 4 + and blood Wassermann negative. A few months after treatment he seemed to become worse and two months later he was given Ogilvie treatment. His mental symptoms entirely cleared up, but later he developed marked physical weakness, unable to stand alone and has remained in this condition since. It is possible that this case is not one of luetic meningitis and we may be dealing with a cortical involvement of the motor areas, but there are no suggestions of juvenile paresis. The third case is probably chronic luetic meningitis with sudden onset,

convulsions and rapid collapse. The diagnosis was made by lumbar puncture and S.-E. treatment instituted at once. The cell count was only 20 at the onset, globulin strongly 4 + and spinal fluid Wassermann 4 +, but blood Wassermann negative. The cell count increased shortly to nearly 400 and showed marked fluctuations for some months. At one time there was an irritative meningitis due to the treatment, in which the cell count reached 2000, but rapidly subsided. The patient cleared up rapidly



CASE 58. CHART 37. J. S. AGE 58. LUETIC MENINGITIS.

after the first few treatments, but developed a polyneuritic delirium with the accompanying symptoms of polyneuritis with general tenderness over nerve trunks. This was accounted for by the fact that he had been indulging in alcohol excessively for some months. The polyneuritic delirium slowly cleared up, memory returned and for one month he felt so well that he would not allow us to treat him. During that time he visited friends away from the city and apparently was in a normal condition. Suddenly at the end of the month he developed a persistent vertigo

for which he had to remain in bed, but it was as noticeable on lying down as standing up. Treatment was immediately resumed at weekly intervals and after two months the dizziness gradually disappeared. At this time, five months after onset of acute symptoms, patient is slowly improving. He still shows some loss of memory, inclined to be playful at times. The globulin content has finally become negative and cell count varies between 5 and 10. After the first month Wassermann reaction was negative and blood reaction has been persistently negative.

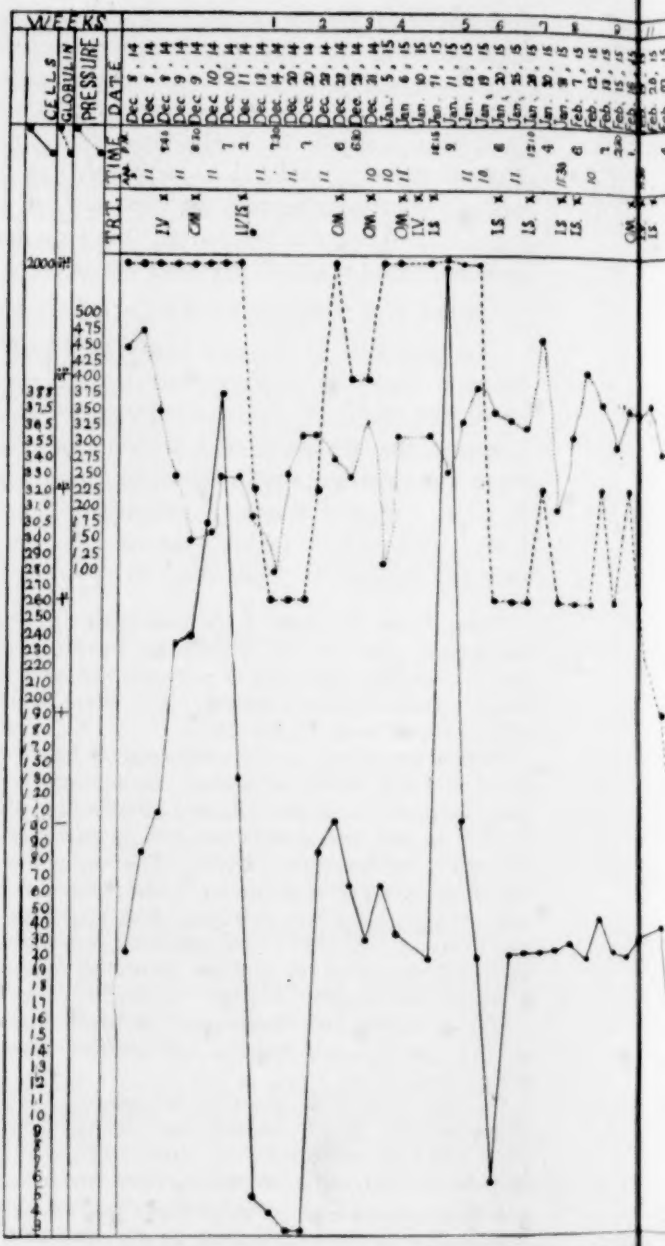
Colloidal Gold Reaction.—5 5 5 5 5 4 4 3 2 1 0.

The diagnosis in this case is not altogether clear, but from the absence of any motor symptoms cerebral syphilis has been eliminated and there has been no evidence of paresis. It is possible, however, that we are dealing with a case of cerebral syphilis and from our experience with these cases prognosis is not so good, if it were a case of luetic meningitis prognosis would be much better; although a chronic type of the case would influence the outcome somewhat. (See chart 38.)

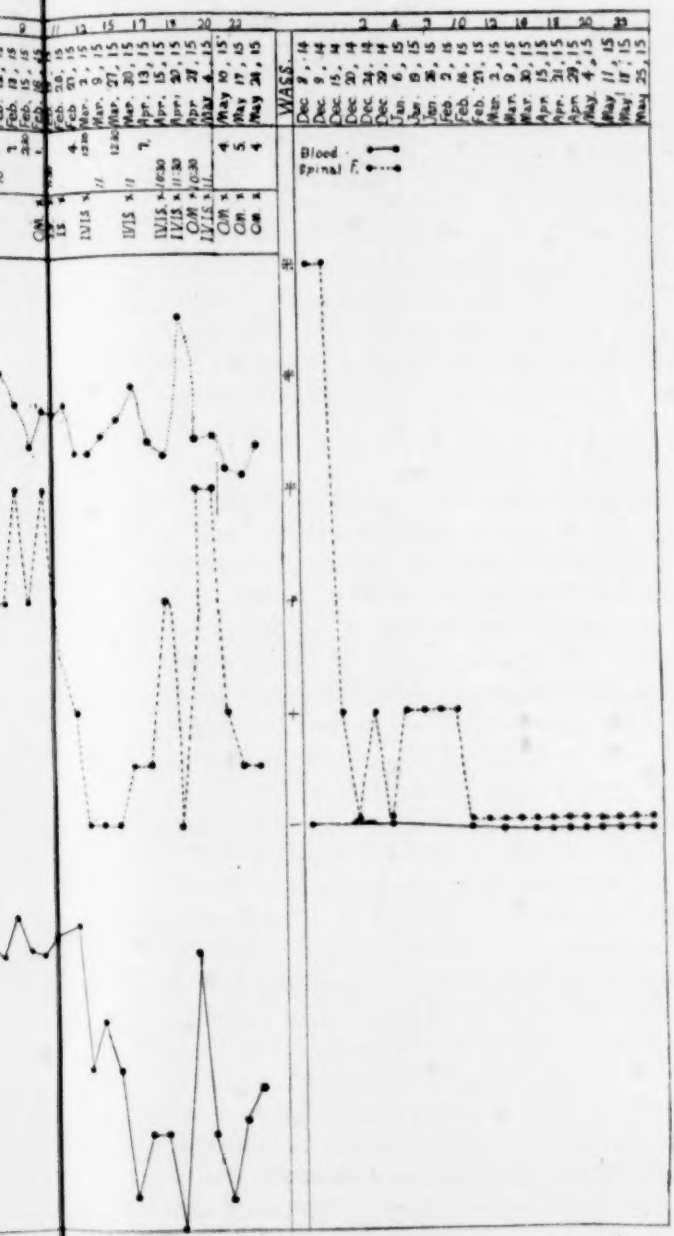
CASE 32.—*G. S. Acute luetic meningitis (see Chart 36). Acute luetic meningitis. Male, æt. 19. Syphilis six months previous. Primary chancre and secondaries. One dose of salvarsan and mercurial treatment. Sudden onset. Headaches and delirium, fever. Rapid improvement and recovery, with two treatments (Swift-Ellis).*

Patient was a boy, aet. 19, with negative family history. Normal childhood, common school education. Occupation, salesman. In November, 1913, developed a chancre, followed by secondary eruption. About January 1, 1914, he was treated with one dose of salvarsan, followed by mercurial treatment, and eruptions subsided. This was six months before admission. About 19 days before admission developed severe headaches, with vertigo and occasional delirium episodes. The headaches had not responded to any treatment; in fact, he was becoming progressively worse. He became progressively worse, and was seen by writer, in consultation with Dr. W. J. Harman, of Trenton, May 13. At that time he was rational, but had severe headaches and some fever. A lumbar puncture showed 688 cells per cc. and 4++4 globulin and positive Wassermann in blood and spinal fluid.

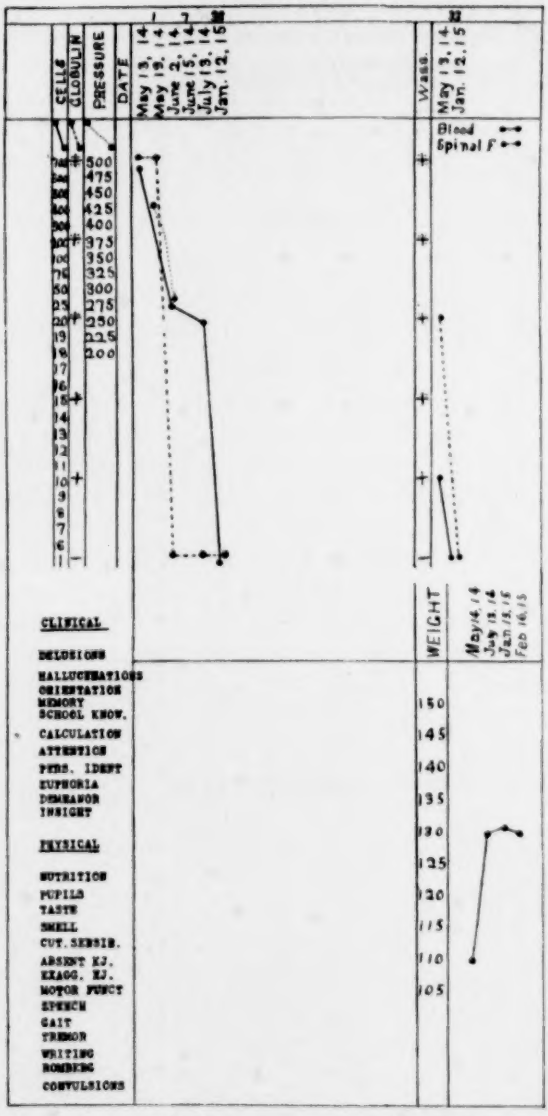
He was advised to come to the hospital, and he was admitted the following day. When admitted was in a mild delirium, which lasted for a day. He had temperature of 100°. His delirious condition was mild and his attention could be obtained. He was well oriented for time, place and persons, and had perfect insight into his condition. He was given two Swift-Ellis treatments, May 19 and June 2, with rapid improvement



CASE A. CHART 38.



38. LUETIC MENINGITIS.



CASE 32. CHART 36. SCHUL. ACUTE LUETIC MENINGITIS.

of symptoms, and left the hospital June 18, able to return to his work. The cell count dropped from 688 to 65 after first treatment, and then to 20 after second. He was seen July 13, and was apparently perfectly well. The Wassermann reaction in blood and spinal fluid became negative.

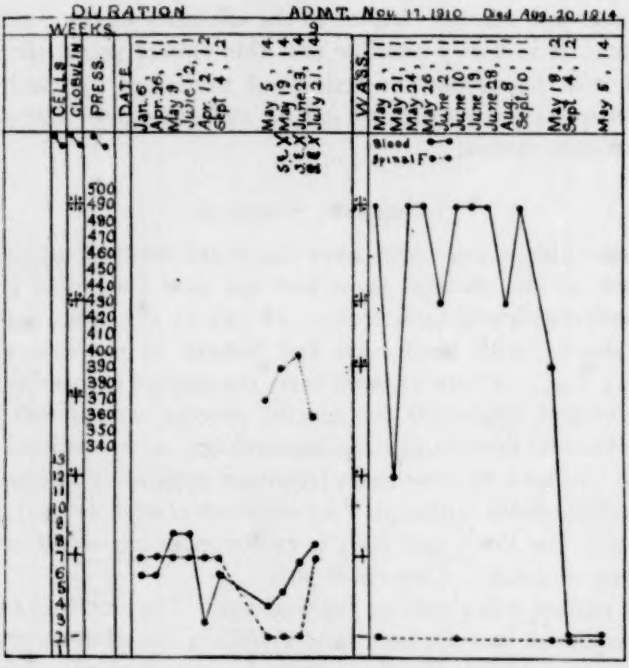
Discussion.—The attending physician, Dr. Harman, deserves especial credit in diagnosing this case and recognizing the need for intraspinous treatment. It is a unique case and one seldom seen by state hospital physicians. The satisfactory and successful treatment add another chapter to the efficiency of the Swift-Ellis method. It is barely possible that this patient might have been cured with intravenous injections of salvarsan, but such rapid and complete recovery could not be affected except through the intraspinous method.

Cerebral Syphilis.

Three cases in our series were diagnosed cerebral syphilis, two of them on the physical signs and one case (66) died and the diagnosis confirmed by autopsy. In two of the cases there had been shocks, with hemiplegia and history of previous syphilis (49 and 50). In both of these cases the biological reactions were negative and apparently the specific process was limited to the blood vessels, thereby causing hemorrhage, with resultant hemiplegia. In both of these cases treatment apparently had no effect on their condition, although they were not treated for any length of time. The third case (66) is rather more important and will be given in detail. (See chart 39.)

The patient was a man 44 years of age. The duration of cerebral symptoms was six years and syphilitic infection occurred 18 years before. His wife was admitted a year before patient in a delirious condition and died two weeks later, and autopsy revealed a well advanced cerebral syphilis of fulminating type. When admitted patient had a tremor of the right lower leg, defective, small pupils, reacted well to light; hearing and taste defective; patellar reflexes much exaggerated, also Achilles reflex and slight ankle clonus. Gait was slow and of a spastic nature, unable to walk without support. Speech thickened, but there was no tremor in writing. At times voided urine involuntarily. Mentally he was quiet and orderly. Remained in bed and cooperated in the examination. He seemed to be in a confused condition. Memory

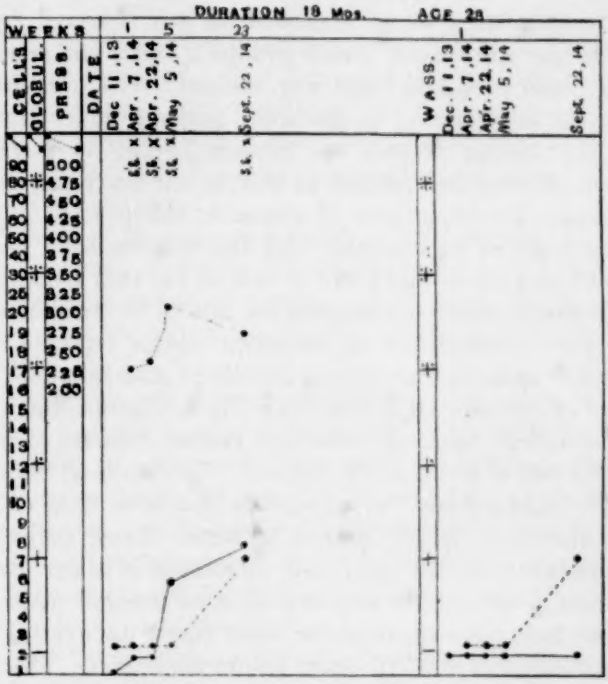
was defective. School knowledge showed deterioration and insight and judgment was defective. He didn't believe his mind was affected, but appreciated his physical condition and the fact that syphilis might be the cause of it. He was admitted November 17, 1910, and in May, 1911, he was given intramuscular injections of salvarsan. There was some improvement in both mental and physical condition following this injection and he was able



CASE 66. CHART 39. VAL. KH. CEREBRAL LUES.

to be up and about, although he still had some defect in gait. He continued in this condition until May, 1914, when between May and July he was given three S.-E. treatments, but the results were unsatisfactory and he seemed to become much worse, and a month later, August 20, 1914, he died. Autopsy in this case showed definite lesions of diffuse cerebral syphilis. In this case the biological reactions did not suggest paresis. The cell count was always low, 7 to 9, the globulin reaction ± or −, the blood Wassermann 4 +, but spinal fluid Wassermann persistently

negative. The case was interesting from the fact that four years ago he improved very much following an intramuscular injection, but condition was made worse rather than improved by S.-E. treatment. It is also unique from the fact that his wife died of the same disease and autopsy confirmed diagnosis in both cases.



CASE 49. CHART 40. HOWD. SM. CEREB. LUES. ADMT. DEC. 3, 1912.

In the other two cases cited the diagnosis was made largely on the history and physical signs, for the biological reactions were negative. From our experience in these cases we are inclined to believe that salvarsanized serum has little effect on cerebral syphilis, although it is possible that in the earlier stages of the disease it might be more effective. These cases were all of long duration and the syphilitic process had probably become spontaneously limited. (For case 49, see chart 40.)

Efficacy of Various Methods of Treatment.

The reason for the different results obtained by similar methods in various hands can be explained only upon the ground of the type of cases treated. It is the case that is at fault and not the method. If we had treated only the types of cases in our groups 3 and 4 we would certainly have to condemn the use of salvarsan unqualifiedly, as no improvement was observed from its use. On the other hand, in our groups 1 and 2 the results are all that could be asked from any method. The greatest difficulty to be overcome is to get these patients under treatment before the disease process has become beyond curative help. We have reported our failures as well as our successes, in order to emphasize the importance of educating the physician and the public at large in this matter. All the failures have not been reported by others as yet, but it is safe to say that a majority of cases of paresis enter the hospital too late to be treated successfully. This accounts for the excellent results reported by the neurologists and others practicing outside of state hospitals. Such men as Fordyce and Ogilvie in New York, Eugene Riggs in St. Paul and others have had excellent results, because they have seen the patients in the early stages. The results at Bloomingdale and Sheppard and Pratt hospitals also have been excellent, because they treat largely private patients. These patients and their families recognize early that something is amiss and seek aid at once, while in the majority of state hospital patients the symptoms have been apparent for some years, the average duration being one and one-half years before admission. That is the reason we claim that the treatment in some hospitals has not been successful and has been condemned. However, we believe that the practicing physicians are capable of diagnosing these cases and in a short time better results are to be expected. Even now patients are referred for treatment much earlier than formerly. We are still undecided as to the best method to be adopted and consequently are using all the methods in order to ascertain which is preferable. Given an early case of paresis, from our experience we would say that the Swift-Ellis method was as efficacious as any. In other words, if the Swift-Ellis treatment fails to arrest the process we have not been able to produce better results in these cases by the other methods. But we do not claim that it

is the exclusive method, although we think our results will compare favorably with the published results obtained by other methods. The criticism of the original method is that it has to be administered too slowly, because of the danger of the intravenous injections of salvarsan; and then treatment extends over a considerable period of time before permanent results can be obtained. It would seem logical to consider that the treatment should be as energetic as possible and the effects produced in the smallest possible time. And this is where the Swift-Ellis is at fault. So we have been combining the Swift-Ellis and Ogilvie methods on alternate weeks with good results. It is possible that several cerebral punctures or ventricular punctures would be advisable in each case.

The value of mercury and iodide of potassium as an adjunct to salvarsanized serum in the treatment of paresis and tabes is at present an unsettled question. It is employed by some, but others fail to see where any benefit results from the combined treatment.

We have not used mercury or iodide of potassium in any of our cases, and our results will compare favorably with the published results of others who have used the combined treatment.

It is possible that in the very early stages of the disease the combined treatment may be employed with good results, but we would not advocate it in every case. In fact it is possible that considerable harm may be caused by mercurializing the patient during the treatment by salvarsanized serum.

The experience in the treatment of paresis with large doses of mercury and iodides, in former years, would rather be against the view of their help in the present treatment. If anyone can show better results by their use we will be glad to change our views in this matter.

There has also been considerable difference of opinion as to the merits of salvarsan and neo-salvarsan and it might be well to state our experience with each. At first we used neo-salvarsan exclusively, although Swift-Ellis recommended the original form. Ogilvie and others were of the same opinion. The general opinion seemed to be in favor of salvarsan, so we have been using this for the last nine months. But our results have not been any better with the salvarsan than with the neo; in fact, in two cases we have

had a pronounced irritative (sterile) meningitis with the Swift-Ellis method with salvarsan but we never had such an experience with the neo-salvarsan.

From our experience we can only say that we prefer the neo-salvarsan.

Conclusions.

In concluding we would emphasize (1) the fact that in the use of salvarsanized serum we have an agent which does cause definite arrest in paresis, which arrest includes improvement in the clinical symptoms, physical signs and a corresponding change in the biological reactions from positive to negative.

(2) That to be effective the case must be treated in the early stages, as advanced stages show no favorable reaction to the treatment.

(3) That the length of time is not always an indication of the severity of the symptoms, but the majority of cases cannot be helped after two or three years have elapsed.

(4) That treatment must be persistent and uninterrupted, grading the amount of dose and frequency of treatment to the condition of the patient.

(5) That tabo-paresis should be cautiously treated, usually with small doses and not oftener than three weeks.

(6) That the remission caused by the treatment cannot be compared to spontaneous treatment, for the percentage in the former is 35.5 per cent and in the latter case only 4 per cent.

(7) That the change in the cell count, globulin content, blood and spinal fluid Wassermann reactions are the direct result of the treatment and not to be compared with the variation found in untreated cases of paresis.

(8) That the efficacy of the treatment depends not upon the type of method used but upon the stage of the disease.

(9) Hence the necessity for early diagnosis in paresis and prompt treatment as soon as possible.

In conclusion I wish to express my thanks and appreciation for the courtesy and assistance of Drs. Swift, Ellis and Ogilvie in giving very helpful suggestions in the carrying on of the work; to the members of the staff at the State Hospital at Trenton for the use of the clinical records made by them, and especially

to Dr. Stevenson for his valuable assistance in the treatment of the patients. I am also deeply indebted to Mr. Williams, bacteriologist in the laboratory for the faithful and arduous work in making the Wassermann tests, and to Miss Lovett, technician in the laboratory, for her valuable work in examining the spinal fluid, and for her excellent charts, and hereby express my thanks to each. To the nurses and attendants who have assisted weekly in the operating room I am also much indebted.

FOCAL LESIONS OF THE CORTEX OF THE LEFT ANGULAR GYRUS IN TWO CASES OF LATE CATATONIA.*

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AND

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ABSTRACT.

I. Introduction.
- Relation of the two angular gyrus cases to previous anatomical work on dementia præcox.
- Former work did not include focally destructive lesions.
- "Late" catatonia and presenile psychoses.
- Arteriosclerotic mental disease.
- Melancholia.
- Campbell on parietal lobes, angular gyrus.
- Question of visual function of angular gyrus.
- Alexia and the angular gyrus.
- Conjugate deviation.

II. Case A.
- Clinical history.
- Autopsy.
- Microscopic study of focal arteriosclerotic lesion of angular gyrus.

III. Case B.
- Clinical history.
- Autopsy.
- Miscroscopic study of solitary tubercle of angular gyrus.

IV. Summary.

V. Conclusions.

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* Being Scientific Contributions of the State Board of Insanity, whole number 119 (1915.22). Read at the 71st annual meeting of the American Medico-Psychological Association, Old Point Comfort, Va., May 11-14, 1915. *(Bibliographical Note.*—The previous contribution (1915.21) was by C. S. Rossy, entitled "Comparison of Mental Gradings by the Yerkes-Bridges Point Scale and the Binet-Simon Scale," submitted to the American Journal of Psychology, September, 1915.)

1. Introduction.

The reasons for reporting these cases are several and distinct. Of course, we mean by our title to suggest a genetic relationship between the focal lesions and the subjects' symptoms. Yet we cannot offer proof of such relationship and are in one sense merely hoping to excite others to opposition or to similar reports. In the next place, however, it is undeniable that every case of truly focal lesion in any portion of the brain's silent areas needs reporting for the purposes of future compilation. And, in particular, lesions of the angular gyrus merit attention because of the very various claims made by experimenters and clinicians concerning its function.[1] Lastly, the fortunate peculiarity of the present lesions—their superficiality and virtual limitation to the grey matter—suggests a special value for these cases in proving the almost purely associational (non-projective) nature of the angular gyrus.

First, concerning the possible relationship between the lesions and the symptoms, we may call attention to the fact that the lesions lodge well within the confines of the posterior association area of Flechsig and that the lesions appear to be accompanied by no structural disorder of the projection system. Hence we might well be entitled to consider that the functional results of these lesions would either be *nil* (or negligible as amounting merely to an undemonstrable minor memorial or conceptual defect) or else in some sense mental. If mental, we might naturally suppose some disorder of memory or of conceptual power, possibly some functional loss which would contribute to a form of aphasia or other disorder of the thought-speech mechanism (see below).

Perhaps what most attracted us to the analysis of these cases was the possibility that they would contribute to the statistical conclusions put forward by Southard in 1910[2] and in a measure confirmed in 1915[3] concerning the relationship between catatonic and parietal lobe lesions. We may recall that Southard found that some *86 per cent* of his series of *dementia præcox cases showed lesions* and that four groups of cases could be separated out on the basis of focal atrophies and sclerosis in particular areas. One of these groups was a group termed post-Rolandic and included cases with lesions in the postcentral and superior parietal regions and in the occipital region. It was those cases with *postcentral and superior parietal lesions* which showed catatonia. Likewise,

at that time Southard described a cerebellar group with catatonia (recalling the not exactly similar theoretical contentions of Kleist[*]) and a small group of infra-Sylvian cases (too small for correlations, although this gap has since been made good by a more extensive analysis of new cases, 1915). Then there was a good-sized group of pre-Rolandic or frontal cases with paranoic features predominant.

That 1910 series was, on the whole, rather deficient in cases with lesions in the more inferior portions of the posterior association area, and we were by consequence watching for such.

No one was more surprised than the physician most acquainted with the first case clinically, Dr. S. W. Crittenden, to learn at autopsy that the case was one of cerebral cyst of softening, since (barring the initial fainting spell) there had been no features to suggest cerebral arteriosclerosis, and the diagnosis had lain between *involution-melancholia* and *catatonic dementia præcox*. In fact, had it not been for the well-established onset at 43 years of age, there might not have been the slightest doubt of the propriety of the diagnosis *catatonia*.

Curiously enough, when the second case came to autopsy, the physician in charge, Dr Wm. W. Dobson, remarked that this case was one of dementia præcox and in view of the contentions of one of the writers as to the parietal correlations of dementia præcox, as well as the results in the first case, inquired whether we might not also in this case find an angular gyrus lesion. The astonishment of all may be imagined when the tubercle was found in the appropriate place.

We may recall that the 1910 series of dementia præcox cases was so drawn as intentionally to exclude all cases of a decidedly "organic" appearance. Thus, had the present case been autopsied at Danvers during the years just preceding 1910, it would *not* have been used to build up the percentage of 86 having focal atrophies or scleroses. In fact eight cases of dementia præcox were actually excluded from the analyzed Danvers material on the score of marked arteriosclerotic changes (as well as five with marked generalized brain atrophy and 11 with marked chronic diffuse leptomeningitis). Some undoubted and beautiful cases of dementia præcox of a group to which the present case may belong were thus excluded from the 1910 analysis in which *complications* had

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rigorously to be shunned. Some day that more "organic" series of dementia præcox cases should be carefully analyzed. Meantime the present case may serve as an example.

What is *late* catatonia? No extended analysis of the literature is necessary for the present note, and we will content ourselves with abstracting Kraepelin's most recent statements. Kraepelin states (1913) that 3.3 per cent of his series of over a thousand (1054) cases of dementia præcox took their rise between the 40th and the 45th year (also 1.2 per cent between 45 and 50, 1.1 per cent between 50 and 55, and 0.2 between 55 and 60).[8] Kraepelin mentions Petrén's 24 cases of catatonia with onset after 40 (including six between 50 and 55, as well as one at 58 and one at 59). Schröder also reported a case with onset at 59. Zweig reported five cases with onset after 40. Schröder reported 16 cases of *Spätkatatonic* (earlier attacks in four).

Those involutional cases which Kraepelin regards (1913) as most open to the suspicion of being dementia præcox are characterized by an onset with *apprehensive excitement* and *depressive delusions* together with *catatonic signs, automatism, inaccessibility, resistiveness, stereotypy of posture and movement*. These cases then speedily terminate in pronounced mental deterioration (occasionally there may be a transient period of improvement at first). Kraepelin also mentions certain paranoid forms which may seem to warrant the diagnosis late catatonia. Kraepelin has no decisive word on this topic and relegates most of the pertinent discussion to his chapters on presenile and paranoid mental disease.

Turning to Kraepelin's latest work on presenile mental disease (1910) we find late catatonia considered as very probably a disease of quite different stamp from the common earlier type of catatonia.[9] "So long as we are completely in the dark as to the causes and nature of catatonia," says Kraepelin, "it cannot be denied that the process which comes on as a rule in youth may sometimes set in later—a point for anatomy to decide." Whereas formerly Kraepelin held that the climacteric might produce the same sort of results as adolescence, he has latterly become convinced that the late cases do not show the same sort of structural changes as the early cases.

To the above sketched clinical description, Kraepelin adds a few other clinical features in these late cases, *e. g., rhythmic movements, impulsive acts, incoherent, disconnected talk*, and says that,

in addition to excited and apprehensive delusional states, there may be cases showing gayety and delusions of grandeur.

It will be shown below that our cases fit fairly well with the main lines thus drawn by Kraepelin for late catatonia. However, inasmuch as at autopsy in the first case, we arrive (however unexpectedly) upon cortical arteriosclerosis, it may be well to summarize from the same Kraepelinian source (1910) the clinical findings in arteriosclerotic insanity.* It will require no thorough study of our case to show how far removed it is from the usual frame of arteriosclerotic insanity.

There are, according to Kraepelin, two main groups of arteriosclerotic mental diseases: 1. A group in which the total psychic *personality* becomes gradually altered, long before there is evidence of mental defect (some of these cases are epileptoid; some progress slightly, others more rapidly; all are rather states of mental weakening than severe dementias); 2. a group in which *sharp seizures* set in early and *paralyses* occur but *mental changes* remain slight (these cases suggest lesions in the larger vessels) until years have passed.

Our first case must surely fall into the former group clinically, if into either group; yet the brain lesion would rather suggest the second group. As a matter of fact, it does not appear that this case ever gave rise to the suspicion of arteriosclerotic mental disease (no bodily weakness until the later stages of tuberculosis, no unsteadiness, incoördination or tremor, no certain evidence of amnesia, no disturbance of speech).

If our first case be not of catatonia, it may possibly be of melancholia in the Kraepelinian sense. It may freely be granted that the case shows various phenomena found in melancholia. We ground our diagnosis on *apprehensive excitement, depressive delusions, inaccessibility, resistivism, mutism, stereotypies of posture, stereotypies of movement and speech, rhythmic movements, impulsive acts, incoherent and disconnected affectless talk, episodes.* These phenomena not only form the vast majority of those which Kraepelin describes as characteristic of late catatonia, but are also in the main not characteristic of melancholia. The possession of certain traits also found in cases of melancholia cannot be said to militate against the diagnosis late catatonia. In any case none would, we suppose, assert that either of the present cases is a typical case of melancholia.

In the above discussion, we have preferred to deal wholly with the Kraepelinian categories and naturally do not object to any critics who may choose to analyze our cases from some other point of view. Adopting the Kraepelinian point of view, we are merely seeking to follow Kraepelin's dictum that "anatomy must decide" in this group.

Turning now to a consideration of the angular gyrus and the possible results of its injury, we find the literature rather full and somewhat dubious.

The parietal area starting with the *precuneus* on the mesial brain surface, includes on the lateral brain surface the *postcentral gyrus* back of the Rolandic fissure and the (superior) *parietal gyrus* at right angles to the postcentral gyrus and running back to the parieto-occipital fissure; within the angle made by the postcentral and (superior) parietal gyri is a sub-region sometimes known as the *inferior parietal lobule*, containing from before backward the *supramarginal gyrus*, the *angular gyrus*, and the often less definite *posterior parietal gyrus*. Thus, could we trust the anatomical landmarks as affording any index or suggestion of functional differentiation, we should have to consider six constituent regions of the parietal lobe (1. postcentral, 2. superior parietal, 3. supramarginal, 4. angular, 5. posterior parietal, 6. precuneus).

If we turn to the cortex histologists, we find that Campbell (1905) differentiated cortex of but four types in this region, *viz.*, the postcentral, the intermediate postcentral, parietal, and common temporal types.[1] As to the controversy over the histological differentiation of the postcentral gyrus, we need not here concern ourselves; nor yet with Campbell's objections to Flechsig's claim of a special supra-angular portion of the superior parietal gyrus, said to ripen early (myelogenetic area 14). The parietal area of Campbell covers the precuneus, the superior parietal gyrus and the anterior part of the supramarginal gyrus.

Concerning the angular gyrus, Campbell first remarks, "The inferior boundary on this surface is the hardest of all to settle; approximately the ramus horizontalis (interparietal fissure) along with the ramus occipitalis of the intraparietal fissure form a dividing line, but these sulci certainly do not constitute a precise limit, for although it is exceedingly difficult, almost impossible, to determine the exact point where "parietal" cortex ends and "tem-

poral" begins, on account of confusion of type, yet I think it correct to say that the "parietal" type tends to cross the horizontal sulcal line and to trespass on the upper part of the angular gyrus, as well as on the upper and anterior part of the supramarginal convolution."

If this be true, then it may be conceived as possible that a few centripetal projection fibers do reach a portion of the angular gyrus, although there seems to be reason for supposing that not many such reach any portion of the parietal area of Campbell.

In so far then as the angular gyrus may partake of the nature of the parietal cortex, we may, in default of more exact knowledge, agree that it has in part a rerepresentative function with respect to sensory impressions (Hughlings Jackson's line of thought); the major portion of the angular gyrus is regarded by Campbell as belonging to the common temporal cortex as defined by him (see Campbell's diagram, p. 158). From Campbell's general adherence to the Jacksonian idea of levels, we assume that he would consider (a) postcentral, (b) intermediate postcentral, and (c) parietal to be (a) receptive, (b) representative and (c) rerepresentative.

Campbell states that with respect to a left-sided *word-hearing* center in the angular gyrus, he can find no histological evidence of differences on the two sides (p. 173). Larinow states that he has produced movements of the ears in animals by faradization of the angular gyrus (C. p. 262). Ferrier also produced lateral movements of the eye (and also of the head?) toward the opposite side by stimulation of the angular gyrus. But Sherrington and Grünbaum failed to elicit any movements (in the higher apes) by stimulation of the angular gyrus.

Ferrier thought that the angular gyrus should be included in the visual area; but it is now commonly believed that, in his experiments, he must have injured underlying optic fibers and that the angular gyrus has no visual function. However, v. Monakow (to use Campbell's words) "promulgates with some emphasis" a view "that there exists no part of the occipital cortex, and possibly none of the cortex of the angular gyrus, with which the macula lutea is unconnected." (Campbell's translation.)

"Clinical observations with subsequent autopsies cannot alone decide the question of the real extent of the human visual area, on

account of peculiarities in its blood-supply on the one hand, and on account of the possibility of new tracts being brought into operation on the other. But the evidence concerning the last-mentioned point, along with that showing that the macula remains intact even after bilaterial destruction of the occipital lobes in the narrow sense, and finally the results of the study of secondary changes, necessarily suggest that the visual area occupies, in addition to the entire cortex of the individual occipital gyri (Cuneus, Lobus Lingualis, Gyrus Descendens, Occ. 1-Occ. 3), at least the hinder part of the gyrus angularis." (Gehirnpathologie, p. 468).

Inasmuch as our first case does show lesions of the hinder part of the angular gyrus, to say nothing of apparent shrinkage of the whole occipital pole, it is interesting to note that Campbell says that " a further point of importance is that a deep lesion in the left occipital lobe seems more likely to bring psychic defects in its train than one affecting the right."

Besides psychic blindness, much has been said concerning alexia (Kussmaul's *Wortblindheit*, Dejerine's *cécité verbale pure*, Wernicke's *subcortical alexia*), that is, an inability to comprehend written or printed language, despite the fact of perfect vision of the letters. To quote Campbell once more: " Clinically, many degrees and varieties of this affection may appear, but fortunately there is almost unanimous agreement concerning its pathological anatomy. In 10 or more cases which have been carefully examined (those of Monakow, Redlich, Verrey, etc.) the surface lesion has been confined to the region of the left angular gyrus and the second occipital convolution, and usually has spread sufficiently deep into the underlying white substance to include the fasciculus longitudinalis inferior, an important band of fibres, the connections of which we shall have to mention presently. And although, in some instances, other bands, *viz.*, the fasciculus longitudinalis superior, the occipito-thalamic radiations of Gratiolet, the forceps major, and in a few cases fibres pertaining to the splenium of the corpus callosum have been involved, the stress of the injury seems always to have fallen on the band first alluded to. Also it is becoming an established doctrine that destruction of the cortex in the region of the angular gyrus by itself, or of the fasciculus longitudinalis inferior by itself, is insufficient to produce alexia; the two must go

together, and for the production of the clinical manifestation long and short systems of association fibres necessarily must be destroyed."

But, in our case, there is no evidence (so far as total brain sections stained by the Weigert myelin method show) of involvement or a destruction of these systems of association fibers.

A review of what Heilbronner has to say in his systematic summary of aphasia, apraxia, and agnosia in Lewandowski's *Handbuch*[7] adds nothing further to the above considerations. "The recognized frequency of reading-disorder with lesion of the (left) angular gyrus is explained by the interruption of communications between the occipital lobe (callosal connections with the *right* occipital lobe also considered) and the sensory speech area." Schuster seems to have shown (1909) that interruption of the *left* optic radiation as such does *not* produce alexia.

Another symptom attributed by many authors to angular gyrus lesion is *conjugate* deviation of the eyes (Landouzy and Grasset, Wernicke, Henschen). Others (Charcot and Pitres, Flechsig and von Monakow) deny this. Lewandowsky (1910) concludes that the parietal region, the inferior parietal lobule and the angular gyrus surely have something to do with conjugate deviation, although the angular gyrus localization has proved to have slight localizing value as compared with the middle frontal gyrus localization, proved by Oppenheim and Sahli in human cases (abscesses).[8]

Henschen reasserts (1910) that no portion of the optic paths and especially not the inferior longitudinal fasciculus sends fibers to the angular gyrus.[9] It would appear that our cases offer strong support to that contention.

II. Case A.

CLINICAL HISTORY.

History.—(B. S. H. 8065, Path. 1912.5). Born in Ireland; parents dead. She went to school until 17; then came to her sister in this country and began working, earning $10.00 a month as chambermaid in a hotel. For the next 10 years patient worked in three different places as chambermaid; before she married at 27, left hotel work and worked at the New England Conservatory of Music at $15.00 a month. It is stated by her sister that she was always well liked, capable, neat in dress, tidy in habits, read good

books and was religious; that she was not given to extremes in anything and had no mannerisms.

Two years after she married she gave birth to a dead child. This was a great disappointment to both her husband and herself, since they desired children. Other uterine history is that she had irregular and painful and profuse periods. Never again pregnant. The hypothesis of syphilitic infection must be here entertained (no test by Wassermann method); or perhaps due to the uterine tumor that produced menstrual disorder. The autopsy showed (besides the arteriosclerosis practically all above the diaphragm) some duropial adhesions in the cervical region, possibly due to old syphilis.

As a housewife she was successful, planned well with her money, was neat, used no alcohol, could sew and was right-handed. She worried over her husband's drinking habits, which it is stated he contracted eight years after their marriage. But for this, sister thinks the marriage would have been a happy one.

Six weeks before coming to the hospital (43 years of age) she had been caring for her sister who had broken her ankle, and one day went to church with her and *suddenly fainted in church*. After that she complained often of her head and worried about small things. Sat looking over her small possessions in her trunk and would say: "My head is sick. Go and get the priest. What'll ever I do—What'll ever I do!" Four days before going to the hospital she thought her husband was going to leave her, since he asked for the house key (to go to mass). After this she was excited and restless, often saying: "Jesus, Mary and Joseph, what will I do—get a priest for me," thinking she was going to die. During this time she did nothing and was not violent until they came to take her to the hospital, and then she screamed and was subjected to restraint.

Physicians' Certificate.—Patient said: "Don't take my John from me. They are going to kill each other. They can't arrest me—I never did anything. They can't put me away. I am going to be left here all alone tonight. Save my soul. I am going forever. Is there a just God? We will all be murdered tonight. They are going to kill John down there. I will jump out of the window." She refused a glass of water, although previously having asked for a drink of water, claiming that it might be poison. Lately she has absolutely refused to take food or medicine. About two weeks ago she claimed to be choking, but on examination everything was normal. Now we cannot go near her, as she is suspicious of everybody and it is impossible even to examine her. She was continually striving to take her clothes off and made an attempt to go out of the window. Excitable and extremely restless. She has been continually making claims that some people have been persecuting her, and she has been constantly in fear of arrest.

Physical Examination.—Emaciated and weak, probably from refusal of food. Has a rapid pulse rate, sordes on teeth and has hemorrhoids. Is constipated, urine is high colored and concentrated, but no albumen.

Her expression is anxious and apprehensive. Thinks her husband and nephew are to be killed. Believes the food is poisoned. Tube fed. For two weeks after admission she was fed by tube and remained very much confused, excited, restless most of that time, wandering about the ward, disrobing, refusing to eat or talk and moaning and muttering incoherently. She became very much exhausted, and finally, after five days, she went to sleep and slept nine hours, after which she seemed stupid and drowsy. After that she took a fair amount of nourishment and slept pretty well, but lay in bed with clothes drawn up over her head and would not talk at all. It is thought that she was not as confused or as suspicious as when she came in.

In 10 days she began eating again, began to answer questions and looked much brighter. Then suddenly became confused and excited, rushed about the ward, frightening the other patients exceedingly, and was transferred to a more disturbed ward. Peered about and started at each sound as though influenced by hallucinations. Four days later a note states that she was still confused and resistive and had to be tube fed. When in her room made an outcry most of the time. Slept poorly.

The next month's notes state that she was apprehensive and distressed. Imagined she had no blood, no bowels, that her back had been stripped off and she was being hanged by the neck. Clenched her throat until it was red and almost raw from her finger nails. When food was placed in her room and the door shut she would eat a good part of it, but would not take any from the attendants. "Worrying herself to a shadow."

A week later than this, three months after admission, a few detached sentences, such as the following can be distinguished: "Can't you see my head can't go through that wall? Sure, I am somebody, I must be somebody. Oh, don't try to do that (as she is being lifted into her bed). Can't you see there is no bed. Don't hold on to me. You will all shut yourselves in here, too. Oh, sure, I am somebody. Oh, there is no bed, there is no room," etc. Appearance of great suffering and exhaustion.

Four month later, confused, apprehensive state most of the time. Mute. Resistive. More or less destructive. Physical examination poor.

A year later.—Still untidy and destructive; sometimes unexpectedly violent. At other times she would allow other patients to strike her and pull her hair without resistance. Lay about on a bench and dozed. When awake pulled at her hair and whined and cried out. No longer any appearance of apprehensiveness.

Two years later.—No change. Untidy and at times very noisy and destructive. Masturbated. Frenzies of excitement.

In April, 1910, five years after admission.—On a chronic, noisy, untidy ward. Had quiescent periods, when she simply lay about on a bench mute, and again, became much disturbed and cried, or rather roared most of the time, and wandered about in a staggering fashion, stamping her feet and seeking somebody to attack. Would fasten her hands in a patient's hair while she was sitting quietly, with a grasp like iron, in spite of her feeble appearance. Resistive about going to bed. Not taken out of doors

except in summer, as she would lie down in the path and refuse to walk. At times she shouted and yelled the same phrases over and over in a high-pitched, monotonous voice for hours at a time. She resisted passive movements.

1911.—Noisy, shouting over and over incoherent sentences and stereotyped phrases. Still very untidy.

June, 1911.—Remained in bed in the same untidy, noisy state. Some days she would shout most of the day, using unintelligible phrases in a high-pitched, monotonous tone. Noisy at night. Small doses of sedatives.

December, 1911.—Six years after admission. Failing physically and, though she resisted physical examination, it was discovered that she has a marked dulness over posterior lobe of both lungs, especially the right, with moist rales. No expectoration.

January, 1912.—Gradually became weaker and died.

Diagnosis on admission, involution melancholia; diagnosis on discharge, dementia præcox.

POST MORTEM EXAMINATION.

Autopsy 13 hours post mortem (M. M. C.).

Cause of Death.—Pulmonary tuberculosis (cultures from).

Acute or Active Lesions.—Cystitis; sacral decubitus; hemorrhage into left ovary; hemorrhage into left renal pelvis and into cyst of left kidney; internal hemorrhagic pachymeningitis with partial organization.

Chronic Lesions.—Emaciation; aortic, coronary, internal mammary, splenic arteriosclerosis; slight hypertrophy of heart; slight atrophy of liver; slight atrophy of thenar muscles; fibromyoma of uterine fundus (6 cm. in diameter) with underlying chronic endometritis; right ovary cystic; chronic focal adhesive peritonitis (ectum, left Fallopian tube, broad ligament, and ovary involved in adhesions; no lesion inside rectum to correspond,) possibly healed syphilis; mammary atrophy.

Anomalies.—Right pupil smaller than left; asymmetry of sternum (lower end deflected to right); left clavicle depressed; nose deflected to left; rigor mortis absent in right arm, trunk, and neck (13 hours post mortem); contractures (?) of hands.

Nervous System.—In addition to slight internal hemorrhagic pachymeningitis, very slight calvarial adhesions, calvarial depressions to accommodate arachnoidal villi and middle meningeal arteries, comparatively thin temporal bones. There are lesions as follows:

Variations in Consistence of Encephalon.—Olives, occipital and frontal poles firmer than hippocampal gyri and cerebellum; the latter in turn firmer than the temporal cortex (this suggests topographical variations in degree of gliosis).

Slight Atrophy of Encephalon.—Brain weight 1145 gm. (Tigges' formula would yield 8 x 1 body length 150 cm. = 1200 gm.).

Cyst of softening of grey matter of left angular gyrus (of almond shape, major axis nearly at right angles to longitudinal fissure, external extremity

slightly posterior, about 4 x 2 cm.) with overlying *sclerosis of pial vessels, notably veins. Slight retraction of left occipital tissues* (atrophy?). *Edema of Gasserian ganglia* (pituitary firm). *Adhesions of dura to pia in cervical region.* Slight basal arterisclerosis (no patches or yellowing).

Frontal sections through the two hemispheres in the plane of the focal lesion were stained by the Wiegert and Wiegert-Pal methods for myelin and by Mallory's anilin blue method for connective tissue. Smaller blocks from the injured, adjacent, and coördinate areas were stained by various methods to arrive at some notion of finer details.

Large brain sections through the middle of the lesion pass through planes posterior to Dejerine's frontal section No. 137 (Dejerine's fig. 266), and display relatively intact (beginning at a point superior to the lesion and skirting the left hemisphere) the *first occipital gyrus, superior parietal gyrus, cuneus, lingual gyrus, third occipital gyrus,* and *second occipital gyrus.* Indeed, small limiting portions of the angular gyrus are likewise intact, namely portions adjacent to the interparietal sulcus above and to the second occipital gyrus below. The plane of section also demonstrates some intact white matter apparently isolated from the underlying white matter: this appearance is explained by the shape of the lesion which is not quite round.

The process in and about the focal lesion seems entirely chronic or (with due respect to the neuroglia appearances) perhaps very slowly progressive. Of first importance is the histology of the cyst itself. The cyst is evidently due to an old necrosis of tissue supplied by a terminal branch of the parieto-temporal branch of the sylvian artery. The thrombotic arterial branch itself was cut at a point about 1 cm. posterior to the anterior border of the cyst of softening and can be seen making off from a previous blood-filled artery. The shrinkage of tissues due to the cyst has caused considerable buckling of the thrombosed artery, unless we are to suppose that the disease process has lengthened the artery. The thrombosis is of ancient date, as evidenced by the canalization of the connective tissue contents of the vessel. Mallory's anilin blue connective tissue stain shows a somewhat denser portion of small dimensions in the middle of the obliterated lumen: it is possible that this represents the remains of an old compressed strand of dissected-off endothelium. If this hypothesis is correct, it is possible that the original thrombosing process was like that found in various acute meningitic processes (pneumococcus and typhoid meningitis, for example). The sections show that the thrombosis extended for at least 1.5 cm. probably a greater distance (in the total-brain section block this vessel can be followed as a gray cord at the bottom of a sulcus stretching forward, outward, and slightly downward to communicate with the main parieto-temporal branch).

The cyst itself shows some collapsing of its numerous connective tissue-septa. Between these septa, which are rarely thicker than pulmonary alveolar walls, are collections of large phagocytic cells stuffed with degeneration products, but with nuclei (not as a rule pressed strongly to one side) rather quiescent-looking and globular. There are numerous small

blood-filled vessels running through the connective tissue septa. There are next to no polynuclear leucocytes in the cyst spaces. There appear to be few lymphocytes and fewer plasma cells (if any); nor are there any accumulations of mononuclear cells about vessels at any point. There is considerable edema in places, and a large vein next to the plugged artery is filled with coagulated albumen.

The edges of the cystic spaces are remarkably definite and only slightly exhibit any suggestion of edema. The neuroglia cells are often supplied with cell-bodies of comparatively large size; but the nuclei even of such cells are not often vesicular. Still, it cannot be denied that the larger size of the neuroglia cell-bodies gives something the aspect of an active zone.

As one passes back from the cyst edge, there is evidence of some loss of tissue, since the small vessels lie in vacuoles containing considerable coagulated albumen, indicating ante mortem dilatation of these spaces. It seems clear that fairly numerous nerve fibers have been lost from the white matter surrounding the actual cyst. There are relatively too numerous capillaries in the tissue of both cortex and white matter surrounding the cystic spaces; and this excess of capillaries shades off gradually in less than 1 mm. into tissue supplied with a normal number of capillaries.

The pial edges of the cystic spaces are interesting from the slight undermining of the tissues which makes it perfectly clear that the subpial zone has great vitality as compared with the underlying layers. This is probably to a great extent due to a separate blood-supply by short meningeal vessels. But there are also signs that the neuroglia itself in the subpial zone is capable of strong reaction: some sections show that the inner face of the subpial layer, as it presents upon the cyst, is very markedly beset with neuroglia cells having expanded cell-bodies. In some places the subpial zone, as it overhangs the cystic space, has become a fifth to a fourth thicker than in adjacent regions where it overlies relatively normal nerve-tissue.

There are also ample opportunities for studying the differential vitality of the various cell-layers.

III. Case B.

J. G., No. 9599. Autopsy No. 1913-47.

Family History.—Patient's father was peculiar and at present (1910) has chronic melancholia. Mother is very nervous, and one sister is in a sanitarium for nervous breakdown.

Personal History.—Patient went to the Boston schools until he was 14. Went into insurance business at 18. He was very successful and remained with one company, A, for 18 years, when he was discharged because his commissions did not show a sufficient increase. This misfortune was a great shock to him and he worried excessively about it, but he at once secured a position with Company B, did well with them and remained there 18 months, when Company A offered to take him back and he

accepted. He was given a very bad district in the slums of Boston, had trouble with his agents and all went wrong. He was admitted to the McLean Hospital February 1, 1910, with the above history, and the onset was given as 12 days before admission, when wife came home from the theatre and found him talking incoherently to himself, which condition has persisted. He has made several attempts to get away from the house and on the morning of admission to the hospital tried to jump from the third story window.

Physical Examination.—On admission to McLean was negative. All his answers to questions were given with more or less hesitation and with many incomplete sentences. He did not appear particularly depressed. There was no evidence of motor retardation. The immediate data of his experiences he took in but did not reason about them. A good deal of thinking disorder. Five days after admission, while sitting in chair, he suddenly slumped to the floor. Reflexes not disturbed. For 24 hours he lay in bed apparently dazed, keeping his gaze fixed very steadily on any new point of attraction. He would not eat and for four days he was tube fed, and at the end of the fourth day again gradually relapsed into the same dazed condition. Pulse 85, temperature in axilla 100. He would open his eyes after several commands, but had to be catheterized. In eight days he became a little more restless, temperature rose to 105, pulse 120, respirations 104. Two hours later, temperature dropped to 101, pulse 110, and the temperature became normal the same evening. Ten days after the initial attack, he suddenly made a rush for the window and resisted being put back to bed. Some days he had periods when he seemed amused; then would suddenly become tense and surly. Between the 15th and the date of admission to this hospital, the 23d of April, he has been much more inclined to fall into fixed attitudes, staring out of the window for 30 minutes at a time without perceptible change in position. Has acquired many habits, such as washing hands a certain way, standing in one place in the room, etc. Often complains that his head feels as if it were stuffed with mud. Often gives answers that are superficially correct, but does not want to take the trouble to put any real thought on anything he says. The striking things of his history are the *heredity*, the *efficiency* up to the age of 36, and a *sudden slump* which was recognized by his employers; followed in two years by marked physical change and increase in his mental incapacity. When he came to this hospital he was 38. His habits were said to be good. Commitment papers indicated that he was *suicidal;* and the patient said detectives were on his track, that he was going to carry a pistol in each pocket to protect himself, that a lodger across the street was a detective and on the watch for him, that there was a scheme in the insurance company to drop him out of sight. Patient was pugnacious and agitated, attempted to jump out third story window.

Other Facts.—Has failed mentally for some months; has lost his position with the insurance company. Has frequently spoken of revolvers and attempted to procure them. Has attacked his wife.

Physical Examination.—Shows a high narrow palate. Sluggish patellar reflex and *unsteady gait.* Coarse tremors of the tongue, disconnected speech—otherwise is negative. He talks constantly, twists his face into many peculiar expressions, but there is no speech defect. *Consciousness* is said to be greatly diminished. Evidently has *hallucinations* of sight and hearing and his attention is markedly blunted. His *memory* is poor and his *orientation* also. His train of thought shows a remarkable flight, of which the following is an example: "My head was driven right down between my shoulders. I was the littlest Jesus in the manger, started in eating straw. If I had been a horse, I'd have eaten my old black hoof. I have palpitation of the heart and liver at seven cents per pound. My father tried to shoot himself in Ayer Junction and Groton, Groton, Groton oil, capital G-R-O-T-O-N spells Groton, rotten whiskey is 15 cents a bottle in Springfield. Bancroft drank vinegar to quench his thirst. There's your knuckle, you bite it and its pinochle. Look at the Spanish-fly blister (pointing to a part of his body where there is no mark of any kind). Of course, suicides run in families, settled in Maine and moved up." In *May, 1910,* is reported as being disturbed, and destroyed clothing. In a highly excited condition, talking continually in a loud, rapid manner and going through many peculiar, purposeless movements. Treated with warm baths and became more quiet, which continued to the last of July, when he had a *temperature* of 103, which persisted for about a week and then became *normal.* In November of the same year, the note mentions that he is in a dull, stupid condition, cannot answer questions intelligently, and seems to be very much *demented.* Owing to his inactivity, his feet are swelling; he has become extremely untidy in his habits and does all sorts of repulsive things. For example—plugging his nose and ears with feces and rubbing feces over his body and hair. In *May, 1911,* he is somewhat untidy but appears brighter, and the next December he is noted as taking more interest in his surroundings. Has been employed in the industrial room and picked up considerably. Enjoyed going to the entertainments, but is said to be semi-catatonic. Later, leaves arms in position placed by examiner for a long time, and was at this time presented at staff meeting where four people thought him *dementia præcox,* though "manic" and general paresis were considered. *Two years* after the initial attack, he is reported as being stupid and answering questions in a whisper, sometimes intelligently, other times irrelevantly and was found to have a temperature of 99 degrees; and had an attack of *otitis media* in the right ear which persisted for 10 days with a temperature range of *98 to 104.* He was at that time tested by the Von Pirquet, which was *negative.* From then on there is a record of his temperature during the remainder of his stay in the hospital which is a continuous one, sometimes for weeks ranging decidedly above normal with upshoots to 102, and pulse between 80 and 118; and during the spring of 1912, the highest temperature not reaching above 102, the second Von Pirquet in March being negative, there appeared a small fluctuant tumor on the left back, between the sixth and tenth ribs near the spine, and tubercle bacilli were present. From then on the notes talk

of discharges from "cold abscesses" in various parts of his body, and physical failure; incoherence in conversation.

August 15, 1913.—Edema of the legs and irregular pulse was noted, which increased with shifting dullness in flanks and a distended abdomen. Physical signs of general tuberculosis and edema.

Summary.—A man, in hospital 44 months and three days, died at the age of 41, after an illness which first appeared to be manic depressive; diagnosis later was dementia præcox with an onset at the age of 36. Commitment at the age of 38 with various attacks of unexplained temperature, and finally died after a long drawn out physical illness, with multiple discharging points of tuberculous abscesses.

The points in favor of general paresis were that at the age of 36 there was a period when business fell off, followed by a period of excitement and a slump, followed by demented condition. There was a tremor of tongue, slight unsteadiness of gait, and the *destructiveness* and repulsive *untidiness* mentioned. But there were no physical signs, and cell-count negative. Consistent with manic depressive phychosis, were suicidal tendencies, heredity, flight of ideas, a reason for worry (being discharged). For dementia præcox—he was discharged because of *inefficiency* at the age of 36—he was *incoherent* in his talk and *superficial* in thought. There were evidently imperative *impulses* when he would try to jump out of the window. There was a period of *mutism* and *refusal of food* and a *stupor* in which he had to be catheterized. There was the assumption of *fixed attitudes and mannerisms,* and lack of ability to think coherently. He thought that the *insurance company was against him,* and he was evidently *hallucinated* for sight and hearing and his speech was rapid and incoherent. His early dementia and inactivity and semi-catatonic reaction make a diagnosis of dementia præcox most probable.

The autopsy showed visceral and brain lesions of extraordinary interest. There was a general anasarca. There were areas of decubitus and there were linear surgical wounds, some still discharging, on the inner thigh, one at Poupart's ligament, one near the anterior superior spine of the ileum, one on the external side of left thigh, and one left posterior inner outcurve of the eighth rib, and there was a swelling 5 cm. in diameter over the sternum at the junction of the xiphoid process. There was also an ascites of a chyliform nature which is unusual.[1]

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[1] Battey-Shaw Journal of Pathology and Bacteriology, volume 6—1900, page 339, notes that Bussey in 1889 first classified various reported cases of chyliform effusions of which there were 115 cases, and 54 cases of hydrothorax of a chyliform form-nature and two of chylus pericardium, and that these were usually due to rupture of or pressure upon the thoracic duct. Allbutt in the system of medicine, page 515, gives the mechanism of production of chyliform effusions as:

1. Failure of heart as a pump, falling of arterial pressure, rise of venous pressure near the heart, followed by fall in capillary pressure and absorption of fluid from the intestines and a diminished urine.

There was in this case no evidence of pressure on the thoracic duct by lymph nodes or growths of any sort, but the heart entered into the general tuberculous process by supporting an abscess which was continuous with the swelling over the xiphoid process that infiltrated the eight intercostal muscles on each side internally, through the articulation of the eighth rib on the left to the anterior mediastinal tissues and to the pericardium and epicardium over the apex. Whether this incapacitating of the heart at the left apex and the surrounding pericarditis was *the* cause of the general anasarca is, of course, an hypothesis, but since all the tissues were flooded with fluid, it is not impossible to suspect that reversed venous pressure and gravity would permit and encourage the transudation of the chyle through the receptaculum chyli.

Tuberculous processes were also in the lungs, in the kidneys and in the left psoas muscle, and there was in the brain a focal area of firmness in the anterior portion of the left angular gyrus, which upon examination proved to be a fibroid tubercle, without caseation. The remainder of the brain was unusually plump and normal in appearance.

We have in this case then an unusual combination of visceral tuberculosis, showing a rare variety of *ascites, a psychosis appearing at the age of 36, and an irritative process* limited to the grey matter in one area of the brain cortex in the post-Rolandic region.

H. P. M. 18. Age 41. Head, Trunk and Cord: M. M. Canavan.

Body of a fairly well-built and poorly nourished white male, 172 cm. in length. *Skin* waxy white, slightly discolored in patches in the neck region. No lymph nodes palpable but skin is full to *saturation* of fluid in all extremities, neck, arms, hands, scrotum and feet, and the *abdomen* protrudes and nearly obliterates the umbilicus.

Pupils.—Right, 0.7 cm., left, 0.8 cm. Rigor mortis present except in arms; *contractures* of legs to point of 45°; *body* in right lateral decubitus. *Decubitus* (superficial) over sacrum 4 cm. in length. There are several *surgical wounds* (linear), 2-3 cm. in length, some of which have healed, some still discharging; they are located as follows: two on right *inner thigh* in upper third internal to sartorious muscle; one at *Poupart's* ligament 4 cm. internal to left anterior superior spine of the ileum, one on external side *left thigh* 10 cm. below trochanter major, and one on *left chest* posterior near the outcurve of the eighth rib. There is a *swelling* 5 cm. in diameter over the sternum at the junction of the xiphoid process. Penis not examined. Tibiæ smooth.

Ventral Section.—Panniculus nil—skin and muscle very thin over thorax and abdomen—the latter particularly, and the stomach and coils of white

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2. Hydraemic plethora rise of main pressure throughout vascular system.

3. Stage of dropsy caused by high capillary pressure and increased permeability due to malnutrition.

4. Hydraemic plethora leads to ever increasing over-filling of the heart cavities, and to failure of the heart.

intestine well out of the incision, as does quantities of opaque thin fluid, (several thousand cc.). Spleen free and large—liver floats away from right side and from diaphragm. Appendix 6 cm. in length. Peritoneum looks clear and also the intestines except for a short space of the small gut where the visceral peritoneum is grey and parboiled in appearance and shows no miliary tubercles. Mesenteric lymph nodes slightly enlarged; fat in mesentery infiltrated by fluid. Diaphragm not measured. Prolapse of rectum slight.

Thorax.—Making the cuts through the skin the swelling before mentioned is undermined and at once a quantity of yellow-green pus exudes. Stained specimen shows detritic remains of cells and tubercle bacilli. This abscess has ramifications of an unusual extent, for connected with this local well of pus are other pockets infiltrating the eighth intercostal muscles on both sides and extending laterally to a line dropped from the nipple on the left to the mid-axillary line on the right, and internally through the articulation of the eighth rib on the left to the anterior mediastural tissues and to the pericardium and epicardium over the apex. *Lymph nodes* in the area outlined are enlarged and all tissues are edematous.

The pleuric cavities are filled with fluid, the lungs floating in it, and the left lung is attached to the chest wall at the apex and to the posterior wall at the base; the right lung adherent at base and diaphragmatic surface. Peribronchial lymph nodes enlarged.

Heart.—Weight (with pericardium and much edematous tissue surrounding), 410 gm. It is impossible to separate the peri- from the epicardium except by dissection, and the apex of this spreading puriform abscess is discovered to be in the epicardium over the left ventricle near the base of the heart, and extends also laterally so that cross-sections of the muscle reveal areas of cheesy material following the coronary left (descending branch) and also in the edematous epicardium. At the point where the pus is the most abundant (near branching of the left coronary), the heart muscle otherwise firm, is semi-disintegrated and softened and of a lighter color. Measurements:

T. V. 11.0 cm.	P. V. 7.5 cm.	L. V. 1.0 cm.
M. V. 10.0 cm.	A. V. 8.0 cm.	R. V. 0.4 cm.

Endocardium slightly grey. Right auricle very small and occupied by a thick cruor clot. The tricuspid valve is also adherent at its otherwise free edges. Note—(Condition of heart perhaps responsible for chylous ascites?).

Lungs.—Combined weight, 380 gm. Lungs are almost collapsed, left shows miliary dots on pleuric surface and a slight tuberculous process at apex (no cavitation) with an enlarged node clinging to apex wall. Cut section shows points of pus in some bronchi with reacting peribronchial infiltration. The right lung shows congestion but no tubercles and a cheesy spot on the lowest lobe posterior, which when separated from the thorax, leaves an infiltrated chest wall near the spinal column. The left upper lobe leaves the same appearance to the parietal pleura. On the right

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M. V. 10.0 cm.	A. V. 8.0 cm.	R. V. 0.4 cm.

Endocardium slightly grey. Right auricle very small and occupied by a thick cruor clot. The tricuspid valve is also adherent at its otherwise free edges. Note—(Condition of heart perhaps responsible for chylous ascites?).

Lungs.—Combined weight, 380 gm. Lungs are almost collapsed, left shows miliary dots on pleuric surface and a slight tuberculous process at apex (no cavitation) with an enlarged node clinging to apex wall. Cut section shows points of pus in some bronchi with reacting peribronchial infiltration. The right lung shows congestion but no tubercles and a cheesy spot on the lowest lobe posterior, which when separated from the thorax, leaves an infiltrated chest wall near the spinal column. The left upper lobe leaves the same appearance to the parietal pleura. On the right

eighth rib posterior near the vertebra is a ragged tear in the parietal pleura and an oozing pus point size of a walnut.

Organs of Neck.—Not removed.

Abdomen.—Spleen. Weight, 250 gm.. Capsule not thickened; organ very plump. No malpighian bodies; trabeculæ indistinct, pulp rich in amount but not soft, no apparent edema.

Adrenals.—Plump and yellow; centrally softened.

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Special Examination.—Pushing a probe through the areas mentioned under general description on right inner thigh the free end of the probe ascends on the inner side of the sartorious muscle and is visible under Poupart's ligament. The right psoas muscle is thin and flabby and soft, and on cutting is seen to be greenish, brown and friable, and the fibers easily separate longitudinally, leaving individual fibers free with large spaces between, and the lumbar nerves are isolated and exposed; the neurolemnia of the nerves looks brownish (note—looks like the residual of a drained abscess). With the organs of the trunk removed, the peritoneum made as dry as may be, though every mesh of tissue has been as edematous as possible, the anterior portion of the spinal column is inspected for twists, curves or caries; none are found. The inner head of the left psoas shows pus in its substance and probably accounts for the pointing of an abscess in left groin. The lymph nodes along the spinal column are enlarged, the sympathetic chain appears smaller in caliber than usual, the retroperitoneal tissues immediately above and below the crura of the diaphragm look ragged, infiltrated and edematous.

Head.—Hair brown, mixed with grey. Scalp not remarkable. Calvarium measures—frontal 0.6 cm., temporal 0.4 cm., occipital 0.3 cm. Dura not thickened nor adherent, pia slightly translucent but at no point opaque.

Some excess of cerebrospinal fluid. Brain softened except for occipital tips and one small focus 1 cm. in the most anterior portion of the left angular gyrus. Basal vessels clear: pituitary small. Ganglions and middle ears negative. Brain weight, 1450 gm.

Cord.—Another attempt to locate if possible any caries of the vertebrae from the posterior aspect, and no curves nor dislocations nor softenings seen, though each vertebra was inspected. Some slight rotation of right fifth and sixth rib on the right. Back muscles very edematous. Transverse processes narrow.

Anatomical Diagnosis (1913-47).—Poorly nourished; general anasarca; unequal pupils; contractures; decubitus, sacral; surgical wounds, legs and back; abscess over sternum (tuberculosis); chylous ascites; mesenteric mediastinal and bronchial lymphnoditis; prolapse of rectum; hydrothorax; chronic obliterative pleuritis; tuberculous pericarditis; pulmonary tuberculosis; intercostal tuberculous abscess; tuberculosis of kidneys (?); beginning cirrhosis of liver; destruction right psoas muscle; pus in left psoas muscle; cerebral malacia; focal *sclerosis* left angular gyrus; brain weight, 1450 gm.

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It is a question how these cells may be interpreted as to the part they play in the lesion. They do not appear more numerous or of a different appearance in the concentric zones above mentioned. They must very probably correspond to the destruction or partial destruction of nerve elements or portions of nerve elements.

A speculation could easily run to the effect that as the necrosis in the tubercle advanced, the surrounding zones themselves gradually advanced, with the neuroglia cells always in the lead. As the lesion advances, it may be supposed that the first thing which happens is the death of neurones or parts of neurones outside the zone of satellitosis in that region which we have described as looking normal but containing expanded neuroglia cells. As the destruction of elements in this part becomes more pronounced, the satellitosis enters. As death finally overtakes the cells, they lose their satellites, and hence the inner zone just adjacent to the capsule is developed, in which dead cells are seen but satellite cells are not prominent.

Meantime, whether from their superior vitality or from the fact that they can get on under less favorable circumstances, the neuroglia cells remain in comparative abundance throughout these zones and in approximately equal parts in all zones.

Accordingly, the tubercle, whatever its age, seems to be manifesting an unusually even extension as indicated both by the regularity and homogeneity of the capsular and pericapsular zones, but also by the evenly diminishing exudate about the vessels in these successive zones.

As to the reaction of the cell layers to the tubercle, no special study of these reactions has been made for the present communication. In the superficial orienting study no indications of a differential reaction were to be found. From the greater thickness of the capsule on the pial side and adjacent portions of the lesion, it might be inferred (though with no great assurance) that the region of greatest activity in the lesion was in this neighborhood and that accordingly the outer cell layers would be more particularly affected at first than the inner layers.

IV. Summary.

In the nature of things no proof can yet be offered of the genetic relationship of lesions of the left angular gyrus and catatonia. It has been claimed by one of the writers that the catatonia of dementia præcox is more a property of parietal (post-Rolandic) lesions than of anterior lesions; and the dementia præcox lesions are not coarse lacunar lesions. Little or no evidence has been

hitherto available as to the relation of *coarse* destructive brain lesions to catatoniform syndromes in diseases other than dementia præcox. It is sometimes stated that deep *left-sided* occipital lobe lesions are more often attended by mental symptoms than identical lesions of the right side. And, of course, the classical relation of the peculiar symptom *alexia* to the *left* angular gyrus (to be sure it is now alleged that the underlying fasciculus longitudinalis inferior must be simultaneously affected to produce alexia) may be urged as pointing *leftwards* to a region of greater psychic interest.

However this may be, the writers present two cases, in themselves interesting, which suggested and obtained the diagnosis dementia præcox, although the cyst of softening in one and the solitary tubercle in the other may well be regarded as withdrawing the cases altogether from the dementia præcox group and settling them in a group of nondescript, coarsely organic, and destructive brain lesion cases.

The experience of these two cases suggests further work to secure psychopathic correlates in other cases (a study of the Massachusetts material of angular gyrus material is far advanced towards completion), and to learn from a large group of so-called "late catatonias" whether there are any which really belong in the true dementia præcox group, as we are coming to conceive it.

Of the two cases, A was female, B male. A's symptoms began out of a clear sky with a fainting spell at 43. B's symptoms began with business inefficiency at 36. A died at 50, having shown no sign of arteriosclerosis after the initial faint. B died at 41, having developed severe generalized tuberculosis, but no focal nerve signs from his solitary tubercle. The diagnosis in each case was perhaps not entirely clear, especially viewed in post mortem light; but each received the diagnosis dementia præcox. There is a suspicion (but only a suspicion) that A may have been syphilitic.

Both patients showed at one time or other *hallucinations of hearing* (B also of sight), *disorder of consciousness, confusion, incoherence, mutism, refusal of food* (tube-feeding), *impulsivity, delusions of persecution, apprehensiveness* (B also suicidal), *fixed attitudes, mannerisms, somatic delusions, destructiveness, violence, stuporous states* (catatonic).

The somatic delusions were partly cephalic, and may perhaps be taken more as illusions:[10] A., "*head sick,*" "*back stripped off and*

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We may now compare the cases with respect to disorders of senses and intellect on the one hand and emotions and the will on the other.

The senses in both cases appear to have been normal.

Aside from periods of *confusion* and *incoherence*, *delusions* of *persecution* and *somatic delusions*, the patients showed little or no intellectual disorder. To be sure, both, as stated above, showed at one time or another, *disorder of consciousness* and *stuporous states* of a catatonic appearance, and it is possible that the *hallucinations of hearing* in both cases may be explained by some sensory or intellectual disorder of an unknown nature.

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The argument is fairly strong in Case A that the lesion was probably correlated with the only *fainting spell* which the patient appears ever to have shown. It will be remembered that in Case A there were no other arteriosclerotic symptoms or any other suspicion of cerebral arteriosclerosis.

With respect to Case B, microscopical analysis seems to show that the lesion may have been in some sense slowly progressive, that is to say, that the necrotic center of the tubercle may have grown slowly larger with an even and progressive expansion of the capsule, parts of which may have been destroyed in the globar spread of the process. Interesting details as to the special features of the successive zones of the lesion from within outward are given above.

If one were inclined to press analogies between these cases and the histological features of ordinary dementia præcox, one might be interested in the observation that the subpial zones in both cases, being origins of greater vitality (perhaps owing to their vascular supply), are the regions of greatest activity. Case A, for example, showed an intense neuroglia reaction in the overhanging subpial zone, and Case B also showed that the outer cell layers would be far more likely to be affected early than would be the inner layers.

This question is not one which can be resolved with such material as is afforded by these cases, nor do we know enough about the differential reactions of the suprastellate and infrastellate zones to make discussion at this time profitable. It may be noted, however, that in the later work of the Munich school, attention has been drawn to the suprastellate layers rather than to the infrastellate layers as a site of lesions in dementia præcox.[8] To be sure, Alzheimer had, so far back as 1897, noted gliosis of the lower layers of the cortex in catatonia;[11] but it appears that later work has tended to reverse this conclusion, or, at any rate, to show that the suprastellate zone is more markedly affected in most cases; at all events, this appears to be the situation in these two cases. What we now need, accordingly, is differential study of the angular gyri in a considerable series of dementia præcox cases, together with a sufficient control series.

Whether the lesions had a direct mechanical effect upon the tissues to give rise to the symptoms in these cases must remain obscure. That the gliosis with its contractile tendencies was more marked in the suprastellate region than in the infrastellate region, is merely an interesting fact that may be more a matter of coincidence than a fact of genetic value.

In work on epilepsy it was formerly claimed that very possibly the contraction of the proliferated neuroglia tissue might evoke or liberate convulsions, whereupon the simplification of neighboring tissues, structurally proved to exist before, would favor the propagation of the epileptic discharge."

Much, of course, must depend upon the site of the lesions and the original function of the cells and tissue in question. Convulsions were not produced in these cases, nor is there any especial evidence in the literature that convulsions are produced by lesions in either angular gyrus.

We leave the question unanswered accordingly, from the data of these two analogous cases, that catatonia or catatoniform symptoms may occasionally be mechanical in origin.

V. Conclusions.

The writers present two cases of chronic lesion of the left angular gyrus which received the clinical diagnosis of dementia præcox. One case showed a cyst of softening and the other a solitary tubercle. It appears that both lesions may well be of suitable age to correspond with the date of onset of the symptoms. Although not in all respects typical, the diagnosis of dementia Præcox seems to have been accepted by the Boston State Hospital officers in charge of the cases. Decidedly atypical is the age of onset of the first case, at 41; the second case had its onset at 36.

The writers are especially interested in the fact that the isolated lesions in these cases are in the parietal region, a region which has been stated in previous work from this laboratory to be correlated with catatonic symptoms. Plates are presented showing the site of the lesions.

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DESCRIPTION OF FIGURES.

Fig 1, Case A.

Total brain sections of the two hemispheres stained by the Weigert-Pal myelin method.

Female, aged 50.

Cyst of softening of left angular gyrus of arteriosclerotic origin due to thrombosis of vessels (demonstrated in special sections).

There is, internal to the cortex lesion, an area of partial destruction of tissue, which is in part due to artefact, but may in part represent a mild degeneration of myelinated fibers. Traces of a similar process are to be seen internal to the calcarine fissure.

Careful external photography and dissection have so far not revealed other arteriosclerotic lesions or lesions of any other nature in the nervous system of this case.

Fig. 2, Case B.

Male, aged 41, with onset of symptoms at 36.

Photograph of the posterior aspect of the surface of section of the brain cut frontally in the region of the angular gyrus. (The photograph was made of the tissue anterior to the plane of section.)

The tubercle is a trifle over 1 cm. in a plane parallel with the convolutional surface, and is about ¾ cm. deep when measured from the pial surface to the inferior edge of the capsule.

No other lesions have been found elsewhere in the brain.

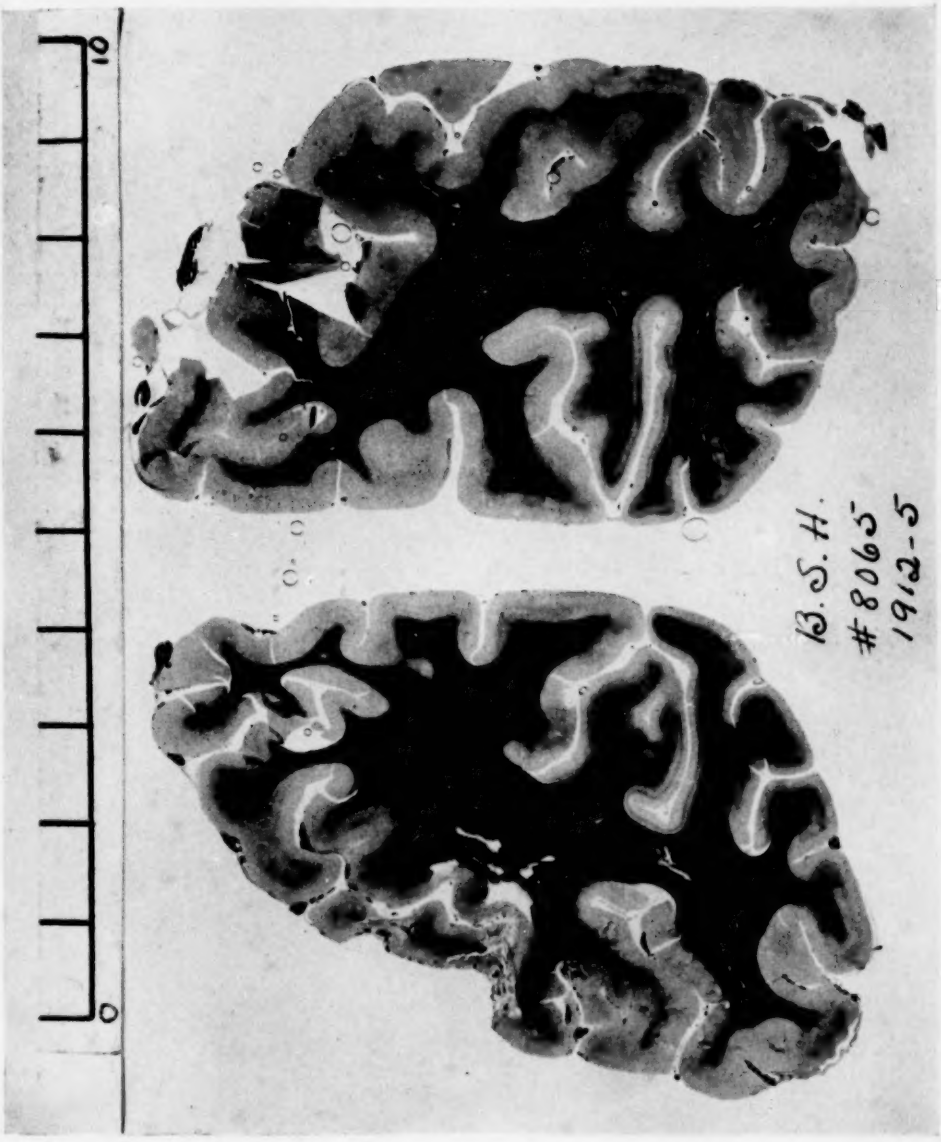

FIG. 1, CASE A.

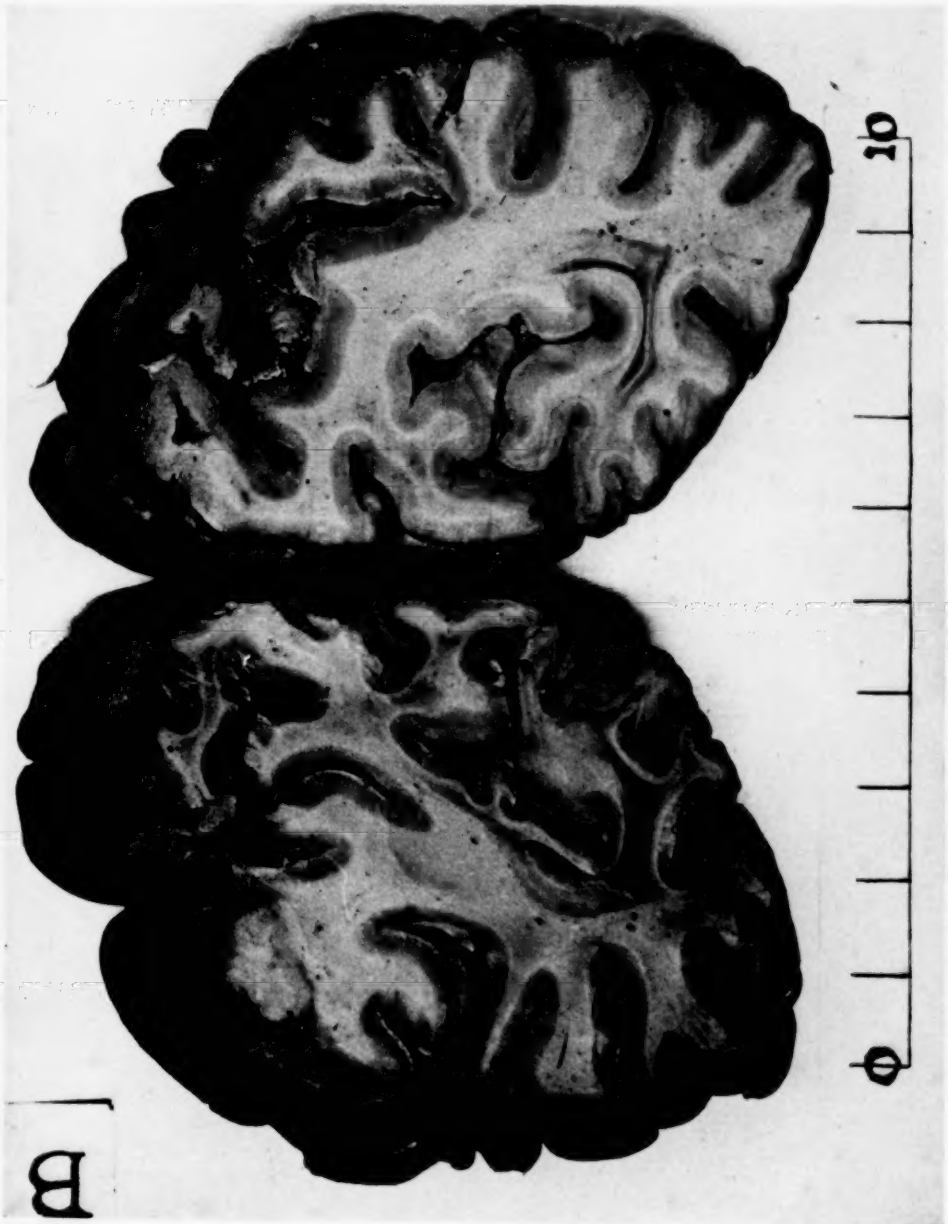

FIG. 2. CASE B.

Notes and Comment.

THE SEVENTY-SECOND ANNUAL MEETING OF THE AMERICAN MEDICO-PSYCHOLOGICAL ASSOCIATION.—The next meeting of the Association, its seventy-second, will be held at the Hotel Grunewald, New Orleans, La., April 4 to 7, 1916.

The secretary, Dr. Henry C. Eyman, of Massillon, Ohio, has issued a preliminary programme giving a partial list of papers which will be presented:

"A Study of Widal's Phenomenon Following Prophylactic Administration of Typhoid Vaccine." Dr. J. Clement Clark, Sykesville, Md.

"Report of Progress in Brain Syphilis Investigations." Drs. Solomon, Southard and Canavan, Boston, Mass.

"The Anti-Narcotic Law." Dr. Geo. A. Zeller, Peoria, Ill.

"Psychoses Associated with Diabetes Mellitus." Dr. W. W. Richardson, Mercer, Pa.

"Waverley Anatomical Researches in Feeble-Mindedness." Drs. W. E. Fernald, E. E. Southard and A. E. Taft, Boston, Mass.

"Mental Deficiency in 2000 Cases Considered Especially from the Standpoint of Sex and Etiological Incidents." Dr. Alfred Gordon, Philadelphia, Pa.

"Asthenic Irritative Insanity." Dr. Michael Campbell, Bearden, Tenn.

"Treatment of Mental Cases in General Hospitals." Dr. Tom A. Williams, Washington, D. C.

"Farming and Gardening as a Diversional Occupation for the Insane." Dr. John N. Thomas, Pineville, La.

"Interpretation of Artistic Work of the Insane." Dr. C. B. Burr, Flint, Mich.

"Psychology of Hysteria." Dr. Wm. G. Somerville, Memphis, Tenn.

"Is Insanity Increasing? Why?" Dr. H. P. Sights, Hopkinsville, Ky.

"Etiological Factors in Dementia Præcox." Dr. Eugene D. Bondurant, Mobile, Ala.

"Phylogenetic Elements in the Psychosis of the Negro." Dr. John E. Lind, Washington, D. C.

"Recidivation in Insanity with Considerations on Classification." Dr. Geo. Villeneuve, Montreal, Quebec.

"Psycho-Analytic Tendencies." Dr. Wm. A. White, Washington, D. C.

"A Psychosis Presenting Schizophrenic and Freudian Mechanisms with Schematic Clearness." Dr. C. C. Wholey, Pittsburgh, Pa.

"Report on Cases of Paresis, Treated by the Swift-Ellis Method." Drs. Allen D. Finlayson and H. W. Mitchell, Warren, Pa.

"Dementia Præcox from a Biologic Viewpoint." Dr. F. W. Langdon, Cincinnati, Ohio.

"Psychoses Associated with Sydenham's Chorea." Dr. Arthur S. Hamilton, Minneapolis, Minn.

"Manic-Depressive Psychosis in the Negro." Dr. E. M. Green, Milledgeville, Ga.

"Inebriety from a Medical Viewpoint." Dr. Irwin H. Neff, Pondville, Mass.

"The Occurrence and Significance of Certain Gyral Anomalies in Brains of the Insane." Dr. Lawson G. Lowrey, Danvers, Mass.

"Korsakow's Syndrome in Pregnancy." Dr. C. Eugene Riggs, St. Paul, Minn.

"The Dementia Præcox and Manic-Depressive Psychoses: their Differential Symptomatology." Dr. H. H. Drysdale, M. D., Cleveland, Ohio.

Papers have also been promised by the following gentlemen, the titles of which have not been announced: Dr. C. A. Porteous, Montreal, Can.; Dr. Geo. M. Kline, Danvers, Mass.; Dr. Carlos MacDonald, New York, N. Y.; Dr. Forest C. Tyson, Augusta, Me., and Dr. Edward Ryan, Kingston, Can.

The annual address will be delivered by Professor Pierce Butler, dean of the Graduate Department, and professor of English in Tulane University, New Orleans.

New Orleans is a city of about 400,000 inhabitants and possesses many features of great and unique interest. It has been spoken of as the most un-American of all American cities. During the month in which the meeting will be held the weather is spring-like and delightful and we feel confident that those who attend the meeting will find, at the journey's end, much of local interest to engage their attention.

It is possible that arrangements will be made for excursions from certain central points in the East, Middle West, West and Southwest whereby congenial parties can arrange to travel to the meeting together. Members living along the Northern Atlantic Seaboard will find a choice of travel by land or sea. The secretary will keep members informed of any special arrangements for travel to the meeting which may be made.

We feel that a meeting and a meeting place which each present unusual attractive features should call out a large attendance.

CELEBRATION OF THE TWENTIETH ANNIVERSARY OF THE FOUNDING OF THE DANVERS, MASS., STATE HOSPITAL LABORATORY ON ITS MODERN BASIS.—A conference was held at the Danvers State Hospital at Hathorne, Mass., on November 19, 1915, to celebrate the placing of the hospital laboratory on a modern basis, with a full time pathologist, in 1895, or 20 years ago.

The conference was made a tribute to Dr. William Leonard Worcester, the first pathologist of the hospital. This act of the past and present members of the hospital staff was a graceful and well-deserved tribute to the memory of one who inaugurated at Danvers and carried on with great success those pathological studies which have since, as they did in his time, reflected much credit upon the institution.

Dr. Worcester was well known to many of the readers of the JOURNAL from personal contact, but probably to a larger number through his contributions to its pages. These were not all in the form of articles relating to psychiatry, but were, many of them, reviews of books which exhibited a discriminating criticism which made his reviews of marked value.

The greater part of Dr. Worcester's medical career, 1873-1901, was spent in institutions for the insane, first at Kalamazoo, Mich. (1878-1889), then at Little Rock, Ark. (1889-1895), and from 1895 to the time of his death in June, 1901, at Danvers. His death, the result of an infection of a finger of his right hand while doing pathological work, added his name to the long roll of medical martyrs to science.

The conference was under the auspices of the Board of Trustees of the hospital, Hon. Samuel Cole, secretary of the board, presiding. In the morning session following an inspection of the hospital and laboratory there was a symposium upon the following topics:

A. The Place of the State Hospital and its Laboratory in the Development of Psychiatry. Those who spoke upon this topic were: James J. Putnam, M. D., pathologist at Danvers 1879-1885; Henry R. Stedman, M. D., assistant superintendent Danvers 1879-1884; Sanger Brown, M. D., assistant physician 1881-1882.

B. On the Encouragement of Scientific Investigation: Its Value to the Hospital and the State System in General. The speakers upon this topic were: Charles W. Page, M. D., medical superin-

tendent Danvers 1888-1898, 1903-1910; Arthur H. Harrington, M. D., assistant physician, 1885-1894, medical superintendent 1898-1903; Harry W. Mitchell, M. D., assistant superintendent 1899-1907, superintendent 1910-1912, and George M. Kline, the present medical superintendent. The discussion which followed the formal remarks was led by Drs. A. M. Barrett, E. E. Southard, H. M. Adler, E. D. Bond, H. A. Cotton and L. G. Lowrey.

For the afternoon session a series of 41 papers appeared on the programme, nearly all by past or present members of the medical staff of the hospital But 16 of these papers, however, were announced for reading, the remaining 25 were presented only by title. We congratulate the management of the hospital upon being able to bring together such an array of papers from men trained in its wards and laboratories and upon the thoughtfulness that made the occasion a tribute to the memory of one whose example and work has been a stimulus to all who followed him.

Book Reviews.

The Work of Our Hands: A Study of Occupations for Invalids. By Herbert J. Hall, M. D., and Mertice M. C. Buck. (*New York: Moffat, Yard & Company, 1915.*)

The object of this book is quite different from that of the one on Occupation Therapy reviewed in this JOURNAL in October. The work then reviewed had for its object instruction in various games and handicrafts for their diversional and therapeutic value while the book under consideration looks upon occupation more from an economic standpoint.

Both viewpoints are bound to present themselves to the hospital physician and it depends largely upon his make-up and still more largely upon the class of patients under his charge, which of these two appears to him the most important.

If he deals with acute cases, who stay under care but a short time and whose recovery and restoration to their previous environment is the matter of paramount interest, he will look upon occupation as a therapeutic measure; one which will be of greater or less value; greater if followed up systematically, less if used in a careless and indifferent manner.

If on the contrary he has charge of a large institution, for example, a state hospital, where many patients remain permanently, the economic value of occupation will impress itself upon him. The same will be true of the physician who has to do with patients who return from his care to their homes in some measure handicapped as regards earning their daily support by reason of physical or mental impairment. Any suggestion which will enable these patients to go out equipped with skill in some craft which is adapted to their condition and which will in some degree contribute to their maintenance will be welcomed—so also as to patients who must remain permanently under care. If they can be led to contribute to their own support, and to the relief of the taxpayers who must provide for them, by the work of their hands while in the hospital, a distinct economic gain has been made. At the same time, if the forms of occupation are carefully thought out and supervised, the patient occupied will be found to be in a much better condition than if left in idleness.

Too often, as Dr. Hall points out, patients in large institutions are put at routine drudgery of house work or out-of-door work on the farm which has neither a mental stimulus nor can it be viewed as supplying in any degree the place of some form of recreation.

Dr. Hall appears to accept without much question the statements of "splendid financial returns" from the work of patients in state hospitals. We believe that the work of patients can be made of value financially, and at the same time physically and mentally to the patient. It is, however,

in the benefit to the patient, the prevention of a hopeless stage of dementia and in the greater ease, and therefore greater economy of caring for such patients, which results from systematic and well-supervised occupation, that the real economics are shown.

If the value of the labor really expended, as measured by results, by patients on a state hospital farm were to be compared with the paid labor and the value of his own supervision and work which an energetic farmer would expend in obtaining the same results, the amount to be credited to each patient for the value of work done would be quite small. The sum which could be paid to the worker or his family, if based upon the real productive value of his work, would, save in exceptional instances, be still less; and if as seems proper and is suggested by Dr. Hall, the saving should be returned to the state to diminish the burden of the patients' support, the balance remaining would be infinitesimal.

As regards patients who have an incurable physical handicap Dr. Hall's teaching is, "make him as useful as possible," as opposed to the usual teaching, "make him comfortable," "because in making him useful you are quite likely to take away hopelessness and despair; and because you may even relieve some of the most distressing symptoms."

Dr. Hall's chapter on the trained nurse and the work cure recognizes the necessity of a special training for the nurse in occupational therapy, but is too brief to be of distinct value as indicating the kind of training which the nurse should have. We are not inclined to agree with him in his warning against teaching a nurse a few amusing occupations "which may be well enough for convalescent children," unless he means to warn against the belief that these will be enough to equip the nurse for helping patients in occupation either as a diversion or a means of support. We have found many patients whose first interest in occupation was aroused by string-work, cutting paper, or a few simple games, who could not have attempted, or even been attracted by more complicated tasks.

We are thoroughly in sympathy with any effort which will help solve the problem of occupation and at least partial support and an increased feeling of independence and therefore, self-satisfaction, for the handicapped. The problem looms large across the ocean where already shops and schools have been established for physical wrecks which have been sent back from the firing lines. Dr. Hall has pointed out some forms of work adapted to the crippled in limb, to those with various nervous defects, and to persons whose hearts or lungs will not permit strenuous or confining work. The steady growth of new problems which confronts the busy hospital physician—many of them problems connected with the social-service department of the hospital, induces one to hesitate before suggesting that he must busy himself in finding occupation suitable for his discharged cases who find themselves unable to follow their former occupation—and must establish schools and shops where these patients may be trained in work suitable to their physical or mental state. Could such schools and shops be established, the return of many patients to the hospital could be prevented and the discharge of many others could be expedited. Each

hospital physician must decide for himself where his most urgent duty lies. Each hospital board must study its budget from still another angle.

Part second is written by Miss Buck and is the result of about 10 years of personal experience.

In the opening chapter Miss Buck says: "It may be definitely stated that the work has been sufficiently hopeful to be convincing of the great possibilities of handicrafts in the future, not only as a means of reclaiming to productive industry many at present incapacitated through illness or lack of proper training, but as a therapeutic agent of great value."

Miss Buck points out that among the "chronics" who frequent hospital clinics in large cities, and who often end prematurely in the almshouse, there are many who could do a little, if only the way were pointed out and that along lines which would not bring them in competition with others struggling to earn a livelihood.

She warns the teacher of crafts who attempts to work with the handicapped not to be so intent on fine work as to lose sight of the human interests involved. She must not only teach her pupil how to work but to think and how to work effectively when he is unaccustomed to work at all. The teacher must be able to arouse interest when the patient does not want to be interested and to know the difference between laziness and indifference and fatigue.

To meet these requirements the teacher, who is also a trained nurse with adequate experience at the bed-side, is the ideal person. If in addition the teacher's work is supervised by a physician who is interested in occupation therapy and who sees also the opportunities for aiding handicapped patients to a means of at least partial self-support, the teacher and the pupils are both working under ideal conditions.

Occupation therapy indeed like other forces of treatment should not be employed without medical direction and supervision.

Miss Buck's section of the book is the larger one and goes much more into detail than does that written by Dr. Hall, where too often the reader is left without sufficient data upon which to build an opinion or from which to draw a conclusion.

One is almost forced to the conclusion that Miss Buck has had insufficient or badly directed experience in the therapeutic application of work when we find her putting "what is called diversional occupation" into the "palliative" class as distinguished from the "remedial" and that her experience has been with a class of patients upon whom she has not seen fit to try the effect of simple diversional occupation, some forms of which she almost contemptuously dismisses as merely fit for children.

We feel confident that with certain patients the first steps in remedial occupation must be in the use of simple diversional occupation; to arouse interest in many cases, because best adapted to physical and mental states in others. The author's attitude in this respect possibly explains her difficulties in working with hysterical patients. Miss Buck divides her section into chapters, treating of occupation in various diseases and various forms of mental disturbance. We regard such a diversion as wholly artificial and

arbitrary—the occupation must be adapted to the individual rather than the individual plus the disease which he has.

It is well for the teacher to know the limitations marked by the patients physicial or mental condition, beyond these the form of the malady is of no importance to the teacher. It is manifest that in some stages of locomotor ataxia patients must be given work adapted to their ability to get about and to their ability to coordinate arm and hand movements. It is also evident that occupation and muscular re-education or training may go hand in hand, but these relate to the patient's condition and not to the name of his malady. Similar work may be just the thing for like states not due to locomotor ataxia.

In the chapters on "mental diseases" the same criticism applies. In writing of dementia præcox nothing is said about re-education and the value of work and training in staying mental deterioration though the reader can see that Miss Buck apparently has this in mind in certain cases. It would be interesting to know exactly what the cases are, who are "more 'queer' than actually insane," who fail from year to year in efficiency. The description sounds much like cases of dementia—but possibly Miss Buck like many friends of patients has her own idea of what constitutes insanity.

The book is an interesting one, perhaps its interest is increased by reason of the things which are left out or only suggested and which make the reader attempt to supply or work out for himself the details he hoped to find. Its main object appears to be to awaken interest in providing occupation for the handicapped—a subject which in many localities is attracting attention and in this respect it fulfils its mission—as a book of instruction to workers among the handicapped either in or out of hospitals we fear it will be found disappointing.

The Answer or The World as Joy: An Essay on Philosophy. By W. J. Chidley. (*Sydney, N. S. W.: Sydney and Smith, 1915.*)

Francis Anderson of the University of Sydney, in the introduction to this book which he says the author asked him to write says: "Mr. Chidley proposes to write a History of Philosophy and at the same time to expound his own theory of human life as a union, or rather harmony of natural and spiritual functions. It is a difficult task to combine two methods in one work, the method of the impartial scientific expositor and the method of the propagandist or preacher of a new gospel."

The author presents after his exposition of philosophical systems a thesis which he has called a Discovery—based upon what he believes to be biological and physiological facts.

The introduction does not vouch for the truth of the "Discovery," but somewhat naively states that "the greater part of this work, however, may be read with profit quite apart from any agreement or disagreement with the thesis set forth in the concluding chapters."

This is as far as the reviewer cares to go. The first chapters contain a hasty and imperfect review of various philosophical systems. It cannot be

dignified by the title of history. The second part the answer has to do with an alleged discovery as to the relation of the sexes which does not deserve the time or space necessary to a critical analysis, which does not indeed lend itself to an analysis. The author appears to have been at odds with the postal authorities in Sydney for circulating an alleged immoral book. We know nothing of the real circumstances of the case nor do we endorse the *obiter dictum* of the Sydney magistrate at Mr. Chidley's trial who said that no philosophical book would be read by the public if it did not contain indecencies, but as to the work before us that which is not a synopsis of the work of others, is not worth reading and would not attract attention, save from the morbidly curious.

Index of Four Hundred and Fifty-eight Post-Mortems of the Insane. Number 1187-1638. State Hospital for the Insane, Norristown, Pa. By Charles J. Swalm, M. D., Pathologist, and Abraham L. Mann, M. D., Assistant Pathologist. With an Introduction by Allen J. Smith, A. M., M. D., etc., Consulting Pathologist of the Hospital. (*Norristown, Pa.: Published by Authority of the Board of Trustees, 1915.*)

This book presents a record in brief terms of the post-mortem findings of 458 cases taken in order from number 1181, died Oct. 7, 1907, to number 1638, died Dec. 10, 1914.

The diagnosis in each case is given, as for example, taking the first six cases recorded, paresis, melancholia acute, melancholia chronic, paresis, dementia terminal, dementia organic. No clinical history is given, no symptoms narrated, nothing which would connect the plain recital of post-mortem findings with bed-side observations.

It will at once be seen we believe that the record is of practically no value. Of what value as throwing any light upon the possible pathology of dementia præcox is the following: 1589 dementia præcox white, female, 74; atrophy of the skull; chronic external pachymeningitis; chronic lepto-meningitis; hydrops meningens; cerebral cortical atrophy; dilatation of the lateral cerebral ventricles; hypoplasia of the right cerebrum, involving most of the occipital lobe; followed by a recital of the findings in the thorax and abdomen? And yet this is a fair sample of all the remaining 457 records.

As an index of post-mortem findings taken in connection with the very elaborate and complete general index, the record is of interest, but as a contribution to the pathology of mental disorders it appears to be of no practical value.

It is to be regretted that the time spent in making these records had not been devoted to a complete study of a few cases taken in connection with the clinical case records.